OPPORTUNITIES FOR CANADA IN INDIA'S MINING EQUIPMENT INDUSTRY

External Affairs and
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FOREWORD

The Canadian mining equipment, instrumentation, and services industry is a world leader. India, like Canada, is a country that covers a vast territory and is endowed with significant reserves of minerals and metals worth exploiting to further industrial development. India's resources in this sector are dominated by coal and iron ore, but manganese, mica, gold and bauxite as well as construction materials, are also being explored for and mined.

India's first mining areas were opened up in the late nineteenth century along the eastern coast. Since then mainly public sector companies such as the Geological Survey of India, Minerals Exploration Corp, Indian Bureau of Mines, National Mineral Development Corp, Manganese Ore (India) Ltd, and Hindustan Copper and Hindustan Zinc have been active in around Udaipur, Nagpur and Calcutta.

The Indian public sector is increasingly looking to the private sector, alone or as partners, to accelerate the development of the mining sector and incentives such as the permission to import components and spares duty free for export production purposes are being utilised to encourage additional growth in the sector.

Indigenous production facilities exist for many of the needs of the mining sector and the government encourages import replacement to conserve increasingly scarce foreign exchange. Under the Eighth Five Year Plan which commences in 1990, equipment worth approximately $3.2 billion is estimated to be required by the mining sector, of which 25% is likely to be in the form of imported equipment and/or components.

Imports are forecast to be concentrated in the following areas:

1) opencast—walking draglines, electric shovels, hydraulic shovels, rocker shovels, dumpers, OB drills, dozers
2) longwall face-shield support, drum shearers, road hearders, armoured face, conventional electricals
3) bord & pillar—long haul dumpers, side dump loaders, auger cum drills
4) exploration equipment—seismic equipment, borehole loggers
5) mining electronics—total mine management systems, mine monitoring and control systems.

As for other areas of the Indian economy, opportunities exist for direct sales but also for joint ventures and the licensing of technology as Canadian manufacturers have already established themselves in terms of performance and reputation. There are a number of suitable Indian collaborators in all areas of the supply of goods and services to the mining industry.

Canadian companies interested in the Indian mining industry as a market for their goods and services are urged to contact the Canadian High Commission in New Delhi and the Canadian Consulate in Bombay in order to acquire specific information and plan their visits of India.

OPPORTUNITIES POUR LE CANADA DANS L'INDUSTRIE D'EQUIPMENTS MNINERES INDIENNE

PREFACE

Le Canada est l'un des leaders mondiaux en ce qui concerne les equipements, l'instrumentation et les services miniers. Comme le Canada, l'Inde couvre un vaste territoire et est doté d'importantes réserves de minéraux et de métaux qu'il est avantageux d'exploiter pour accoitre son développement industriel. Dans ce secteur, les ressources indiennes sont dominées par le charbon et le minerai de fer. Toutefois, le manganése, le mica, l'or, le bauxite ainsi que les matériaux de construction sont également exploités.

Les premières zones d'exploitation minière indinnes ont été mises on opération le long de la cóte est vers la fin du XIXe siècle. Depuis lors, ce sont surtout des compagnies publiques, comme la "Geological Survey of India", la "Minerals Exploitation Corp.", le "Indian Bureau of Mines". la "National Mineral Development Corp.", la "Managanese Ore (India) Ltd." et l"Hindustan Copper" et l "Hindustan Zinc", qui ont été actives dans les environs d'Udaipur, de Nagpur et de Calcutta.

Le secteur public Indien se tourne de plus en plus vers le secteur privé, seul ou comme partenaire, pour accélérer le développement de secteur minier. Des stimulants comme la permission d'importer des composantes et des pièces derechange hors taxe, en vue d'une production pour l'exportation sont utilisés pour encourager une croissance additionelle de ce secteur.

Les facilités de production locales existent et permettent de répondre à plusieurs des besoins du secteur minier,aussi le gourvernement encourage-t-il be remplacement des importations pour conserver les devises étrangeres qui se font de plus en plus rares. Dans le cadre du huitième plan quinquennal, qui débute en 1990, des équipements d'une valeur approximative de $3,2 billions seront requis par le secteur minier, dont 25% prendront possiblement la forme d'équipements et/ou de composantes importés.

On prévoit que les importations seront concentrées dans les secteurs suivants:
1) mines à ciel cuvert - pelles électriques, pelles hydrauliques, pelles à bascule, camions à bascule, drilles OB, bulldozers.
2) longs murs - supports de protection, équipements pour cisailer, écrans de son, écrans de protection, systémes électriques.
3) bords et piliers - déchargeuses, chargeuses a déchargement latéral, drilles/foreuses.
4) équipments d'exploration - équipements séismiques, équipements pour percer des trous.
5) électronique minier - systeme de gestion intégrée des mines, systeme de suivi et de controôle.

Comme dans d'autres secteurs de l'économie indienne, des opportunités existent pour les ventes directes ainsi que pour les associations d'entreprises et les ventes de licences de technologie, d'autant plus que la performance et la réputation des manufacturiers canadiens sont reconnues dans ce secteur. il y a de multiples collaborateurs indiens convenables dans tous les domaines d'approvisionnements de biens et de services miniers.

Les compagnies canadiennes intéressées par l'industrie miniere indienne comme marché de biens et services sont priées de contacter le Haut Commissariat du Canada à New Delhi et le Consulat du Canada à Bombay pour obtenir de l'information spécifique et planifier leur visite en Inde.

TABLE OF CONTENTS

INDIAN MINING INDUSTRY

PART I—SUMMARY AND FINDINGS

List of Equipment Studied 5
The Indian Mining Scenario 5
Overview of the Indian Mining Equipment Industry 6
A) Exploration Equipment
B) Mining Equipment
C) Opencast Mining Equipment
D) Underground Mining Equipment
E) Mining Electronics
Scope for Entry 9
— Product categories where imports will continue in future with list of potential Indian collaborators.
Conclusion 10

PART II—FACTS AND FIGURES 11

ANNEXURE	SUBJECT	
1	India's mineral production vis-a-vis world production—1987	11
2	Share of major minerals produced in India (excluding oil) 1988	12
3	Production targets for mining industry	12
4	Location of major mines (metallic minerals) in production in India	13
5	Location of major mines (non-metallic minerals) in production in India	14
6	Location of major coalfields of India	15
7	Major suppliers of electromagnetic equipment in India	16
8	Major suppliers of seismic equipment in India	16
9	Trends in growth of opencast mining (coal) in India	16
10	Estimates of future demand for opencast mining machinery (coal) for India	17
11	Estimates of future demand for opencast mining machinery (non-coal) for India	18
12	Estimates of future market for opencast mining equipment (by value) for India	18
13	Supply sources for major opencast mining machinery in India	19
14	Demand supply comparisons of major opencast mining machinery in India	20
15	Foreign collaborators of major opencast mining machinery manufacturers in India	20
16	Estimated Import content of major opencast mining machinery in India	21
17	Estimated imports of opencast mining machinery and components in India	21

18	Trends in production through bord & pillar mining in India	22
19	Trends in usage of bord & pillar equipment in coal mines for India	22
20	Estimated population and future demand for mechanised bord & pillar equipment—coal sector for India	22
21	Estimates of Underground bord & pillar equipment requirement—non coal sector for India	23
22	Major manufacturers of mechanised bord & pillar equipment in India	23
23	Trends in growth of LWF coal production	23
24	Percentage break-up of cost in a LWF package	24
25	Manufacturing capacity and collaborators–LWF manufacturers	24
26	Future trends in upgrading of equipment in the longwall package	24
27	Trend in import content	25
28	Major suppliers and their product range	25
29	Applicable tariff structure for imports of mining machinery in India	25
30	Product-wise analysis of competition in different sectors of the mining industry in India —Opencast mining equipment —Bord & Pillar mining equipment —Longwall Face mining equipment —Exploration equipment —Mining electronics	26
31	Profile of selected potential collaborators for mining equipment in India	27
32	Name & addresses of mining equipment manufacturers in India	30
33	Some important Canadian government addresses	47

PART I—SUMMARY AND FINDINGS
LIST OF EQUIPMENT STUDIED

A. EXPLORATION EQUIPMENT

1. Electrical
2. Electro magnetic
3. Gravity measuring
4. Seismic
5. Bore-Hole Logging

B. OPENCAST MINING EQUIPMENT

1. Electric/Hydraulic Shovels
2. Walking Draglines
3. Dumpers
4. Front-End Loaders
5. Drills
6. Dozers
7. Scrapers
8. Graders

C. BORD AND PILLAR EQUIPMENT

1. Coal Cutting Machines
2. Mechanical Loaders
3. Drills
4. Mechanical Conveyors
5. Load Haul Dumpers
6. Side Dump Loaders
7. Ager Cum Drills

D. LONGWALL FACE EQUIPMENT

1. Powered Roof Supports
2. Armoured Face Conveyors
3. Drum Shearers
4. Electrical—Power Pack etc.
5. Ancillary Equipment
6. Gate Belt Conveyors
7. Bridge Stage Loaders

E. MINING ELECTRONICS

1. Monitoring & Control systems
2. General telecommunications
3. Telemonitoring systems
4. Resource management systems

THE INDIAN MINING SCENARIO

India is among the top mineral producers of the world in certain essential minerals such as coal, iron ore and chromite. The country's production of principal minerals was valued at about $8150 million (Cdn) in 1988, and registered a growth rate of about 23% per annum in current terms over a 5 year period.

Production in the Indian mining industry is estimated to grow at about 8% per annum during the Eighth Plan period (1990 to 1995). The target for coal and lignite production has been fixed at 315 million tons, and the production of metalliferous minerals is projected to be 190 million tons by the end of 1995.

The mining industry in India accounted for an output of $5.1 billion (Cdn) in 1987 representing 2.5% of India's GNP, of which coal sector accounted for 63%, followed by oil and gas and metalliferous minerals contributing 25% and 12% respectively. While the coal sector is the largest employer, metalliferous minerals rated the largest number of mines. In some cases like iron ore and bauxite, Indian reserves constitute up to 5% of the world's total reserves.

India's reserves are concentrated in certain areas of the country. Refer to annexure 4,5 & 6 for details. In terms of penetration, only about 50% of the total and area has been explored for minerals uptill now. The states of Bihar, Madhya Pradesh, Assam, Gujarat, West Bengal and Andhra Pradesh together constitute about 87% of the total value of minerals produced in the country. Of these, coal accounts for as much as 75% of the total value, followed by limestone and iron ore at 5% and 6% respectively.

Production of coal as well as metalliferous minerals (tonnage) is expected to grow at 8% per annum over the 8th Five Year Plan period (1990-95).

OVERVIEW OF THE MINING EQUIPMENT INDUSTRY

The Indian mining industry is going through a period of rapid growth and expansion which will require greater mechanisation and up-grading of mining technology. The industry can be broadly classified into two sectors:

A) Exploration equipment
B) Mining equipment

A) Exploration Equipment

Exploration equipment can be further sub-divided into the following categories:
a. Electronic equipment
b. Electromagnetic equipment
c. Gravity measuring equipment
d. Bore-Hole logging equipment

The Geological Survey of India used to manufacture its own equipment until the 1970's, but now imported systems are used for deeper exploration work. Canada enjoys a major market share in case of electrical equipment.

Electronic, electromagnetic and gravity measuring equipment for example resistivity meters, induced polarization meters and magnetometers are largely coming from Canada. Seismic equipment is being imported from USA, Canada and Japan. The current population of bore-hole logging equipment is estimated to be 35 of which 20 are expected to be phased out over the next few years. This is likely to generate a replacement demand for the same number of units. The major suppliers of these equipment are from USA, Australia and Japan.

B) Mining Equipment

Indigenous production capabilities seem to exist for most of the equipment with imports being largely in the form of essential components. Most large Indian manufacturers have collaborated with world renowned companies so as to be able to supply more or less the entire range of equipment required by the buyers.

Currently, electrical and hydraulic systems, and certain essential components for various equipment are being imported. The import content today is almost 90% in the case of exploration equipment; about 25% in the case of opencast; less than 10% in Bord & Pillar; about 50% in Longwall Face; and marginal in mining electronics.

The percentage of imports is expected to recede to essential components by the end of the Eighth Five Year Plan, as almost all the imports are administered under a phased manufacturing program, wherein close to 100% indigenisation has to be achieved within a time span of 10-12 years.

The coal sector—which is the major buyer, is standardising its equipment requirements, and the indigenous mining equipment manufacturers have also undertaken plans for modernising their production facilities and increasing production to achieve economies of scale.

The major mining equipment required during the Eighth Plan period is estimated to be worth roughly $3200 m. (Cdn), of which about 25% is expected to be in the form of imported equipment and/or components.

The mining equipment industry in India is distributed in various segments as follows:

Type	Estimated Market Size (in Rs. m.)	Estimated Import Content
Opencast mining	6000	20%
Bord & Pillar (B & P)	300	10%
LongWall Face	900	50%
Total	7200 ($510 m. Cdn)	

Imports in the opencast mining equipment sector at $85 million (Cdn) were the highest in 1988 followed by 32 million (Cdn) in Longwall Face mining equipment sector.

The sub-group of the Planning Commission for the Eighth Five Year Plan has estimated that approximately $1 billion (Cdn) of total mining equipment will need to be imported either directly or in the form of bilateral assistance.

Indian manufacturers of mining equipment are expected to meet the balance of $2.2 billion (Cdn) worth of requirement during the Eighth Five Year Plan period. Most Indian manufacturers have technical collaborations with world renowned companies, and most of these also manufacture other engineering and/or related goods. None of these manufacturers are entirely dependent on the mining industry for sales. This is because the major buyer in the mining industry is the coal sector and the demand for mining equipment in the past has been quite erratic both in terms of numbers as well as value. The coal sector has now begun to standardize this requirement which has encouraged Indian manufacturers to increase production and attain economies of scale.

All collaborations in this sector are administered under the phased indigenisation program of the Indian government. This policy insists that the import content in the terminal year (Fifth Year) of production should be brought down to 0-5% level. Indian firms in the public sector are sometimes allowed to import 50-60% in the first year, whereas the same import content may be lower at 30% if the collaboration is in the private sector.

C) Opencast Mining Equipment

Most metalliferous mines in India are opencast mines. The share of production of these mines has been increasing steadily and it is estimated that 60% of Indian coal comes from these mines today. The share of these mines is expected to increase further in the next decade. There is also a trend towards increasing the average mine size from the current 1-3 million tons to 5-10 million tons per annum. In addition, it is planned to improve average stripping ratio of opencast mines from the current level of 1.5-2 cubic meters to 4-7 cubic meters.

Two types of opencast mining techniques are prevalent in India:

a. Shovel Dumper System
b. Dragline — Shovel Dumper System

It is estimated that major demand in future will be for equipment like dumpers, dozers, electrical and diesel shovels and drills. Demand for equipment like scrapers, pay loaders, cranes, etc. seems to be on the decline.

There is an evident shift towards usage of higher horsepower equipment particularly for opencast coal mines.

At current prices, it is estimated that the total demand for opencast mining machinery will range between $425-500 million (Cdn) per year. Adequate domestic mining capacity exists to meet this demand. However, imports are likely to continue in the case of draglines and rope shovels. Most large Indian manufacturers of mining machinery have technology tie-ups with leading international manufacturers from countries like US, UK, USSR, Japan, FRG and France. Most of these manufacturers have also indigenised their products to a varying extent.

The present import content by value is highest at 80% in the case of dumpers (above 110 tons) followed by rope shovels — 70%, draglines, front end loaders, and dozers — at 30% each.

It is estimated that opencast machinery imports during 8th Five Year Plan period will be in the region of $ 570 million (Cdn), of which $ 470 million (Cdn) will be sub-assemblies and components under the phased manufacturing program of Indian manufacturers.

D) Underground Mining Equipment

Most of the mines in India are coal based. Bord and Pillar (B&P) has been the traditional method of mining in India. There has been a recent shift towards newer technology like LongWall Face mining (LWF), but the B&P method is expected to continue. The present share of conventional B&P mining is estimated to account for 95% of B&P mining, 5% of which is mechanised. It is expected that B&P mining will account for about 30% share by the year 2000. The future growth is largely in the mechanised B&P sector only. Indian manufacturers have tied up with collaborators from USA, Germany, UK and USSR for production of mechanised B&P mining equipment.

The current import content of this equipment is fairly low and is expected to be fully indigenised by the year 1995. There seems to be sufficient Indian capacity available to meet the expected future demand for these products.

Due to the recent thrust towards upgrading technology and mechanisation, LongWall Face equipment production in India has increased progressively. In absolute terms, the share of the LongWall Face method is expected to remain small at 11% by the year 2000. This is because the LongWall Face technique is still being tried out on a experimental basis.

The current size of the LongWall Face market is estimated at $ 64 million (Cdn) of which 50% is imported. About 75% of the current population of LWF is with the coal mines of Coal India Ltd. and the balance are with the mines of Singareni Collieries. Some 75%of present LWF equipment has been supplied by Indian manufacturers and the balance were imported from the USSR, Poland and UK.

At present, LWF technology exists for chock shield supports of up to 500 ton capacity. Demand for LWFs with more rigid support like chock shield support up to 750 ton capacity and shield supports up to 550 ton capacity is likely to increase in future. Add on features like electro-hydraulic controls and load indicator monitoring would also be sought. The trend in drum shearers is also expected to be towards heavier duty equipment. Indian manufacturers are gearing up to meet this challenge. However, it is expected that they may import this technology initially from France, FRG or USSR under various bilateral agreements.

Upgrading of technology is expected to take place in LWF equipment electricals so as to move towards higher voltage (3.3 KV) systems, micro-processor control based monitoring systems and radio control of operations at the face. Imports of electricals are likely to continue in future. Significant imports are also likely to continue in the case of heavy duty drum shearers, crushers and lump broachers.

E) Mining Electronics

This sector offers tremendous scope for import of know-how particularly in the areas of:

a. Seismological equipment
b. Total resource management systems
c. Micro-processor based process control equipment
d. Sophisticated telecommunications systems

India is installing Total Mine Management System (TMMS) with foreign know-how on an experimental basis. The primary objectives of mine electrification is to improve communication, safety and overall efficiency of operations. Coal India Ltd. has identified about 200 mines for electrification under a phased program as follows :

Phase I — 40 mines to be completed by year 1990-91
Phase II — 60 mines
Phase III — 100 mines

The requirements of electronic equipment during the 8th Five Year Plan is expected to be over $200 million (Cdn).

Indian companies are manufacturing mining electronic products with different foreign collaborations (eg. loud hailers, telemonitoring equipment, VHF system, CCTV, CDS, methanometer, laser alignment, leaky feeder communication system, inductive loop radio system for underground mines, production monitoring etc., computer based telecontrol conveyor system, thyrister drives, microprocessor based telemonitoring and washeries automation system.)

SCOPE FOR ENTRY

The high demand of the mining industry has created major opportunities for entry into the mining equipment market. Given the evolution of this industry and the high entry barriers in each segment, the scope for exploiting the opportunities seems more attractive for existing indigenous manufacturers than for new entrants. Hence, Canadian companies are better off tying up with an existing Indian manufacturer in the industry for local production.

Across segments, the product categories where imports are likely to continue are as follows:

Product categories where imports will continue in future

Mining Technique	Major Equipment	Range
Opencast	Walking Draglines	6 CU.M/45 M.
	Electric Shovels	Above 12.5 CU.M.
	Hydraulic Shovels	Above 5 CU.M.
	Rocker Shovels	N.A.
	Dumpers	Above 170 T
	OB Drills	311-385 MM
	Dozers	Above 650 HP
LongWall Face	Shield Support Drum Shearers Road Headers Armoured Face Conventional Electricals	Imports will be in the form of essential components for the equipment and power packs, and electricals
Bord & Pillar	Load Haul Dumpers Side Dump Loaders Auger Cum Drills	Imports will be in the form of essential components.
Exploration Equipment	Seismic Equipment Bore-Hole Loggers	Imports will be in the form of whole equipment.
Mining Electronics	Total Mine Management Systems and Mine Monitoring & Control Systems.	Imports will be in the form of total packages.

Opportunity for entry exists mainly for exploration equipment, opencast mining equipment, and mining electronics segments of the industry.

There is scope for supply of seismic and bore-hole logging equipment in the exploration equipment segment, and for the supply of monitoring and control systems including Total Mine Management Systems (TMMS) in the mining electronics segment.

Both of the above areas present immense growth potential. There is scope for the supply of exploration equipment in terms of transfer of technology, as well as direct sales, since Canadian manufacturers have already established themselves in terms of performance and reputation.

In the case of entry into the mining electronics segment, the scope for entry exists, both in terms of technical know-how as well as financial collaboration with existing electronic product manufacturers.

Some of the potential collaborators in this context could be:

1. Manufacturers of electronic products in the public sector viz.
   a) Bharat Electronics Limited
   b) Indian Telephone Industries
   c) Computer Maintenance Limited
   d) Centre Electronics Limited
2. State Electronic Corporations or joint sector companies like UPTRON, KELTRON, MELTRON, etc.

3. Manufacturers in the private sector like:

   a) Hindustan Computers Limited (HCL)
   b) Wipro Limited
   c) NELCO
   d) BPL Limited

Entry into the opencast mining segment could also be either through technical know-how collaboration or through sale of equipment via local agents. Production of opencast mining equipment is expected to grow at a rapid rate, given the fact that almost all the production from metalliferous mines is going to come from opencast mines. Further, the imports are highest in this segment and demand-supply gaps exist only in this segment. However, in view of the structural analysis and major threats to entry in this segment, entry by either means would have to be timely and efficient.

In the above context, the strategic options in terms of selection of potential collaborators would be:

1. Entry with a firm currently catering to a single segment but which might want to enter (through collaboration) into another segment:

   Opencast segment
   a) MAMC
   b) Eimco Elecon

   LWF segment
   a) Eimco Elecon
   b) TELCO

   B & P segment
   a) BEML
   b) Jessop & Co.

2. Entry with a firm existing in a given segment looking for expansion and/or diversification of existing product range:

   Opencast segment
   a) BEML
   b) HEC
   c) TELCO
   d) HM

Foreign collaborations in the Indian exploration and mining equipment industry largely exist with manufacturers from U.S.A., U.K., France, Germany and Japan. Currently, no major collaboration exists with Canadian firms for the manufacture of mining equipment. However, Canadian manufacturers like Scintrex in exploration equipment, and Jarvis-Clark in B & P mining equipment are among the largest — in terms of Canadian penetration, and most widely accepted Canadian companies in India.

Conclusion

The scope for entry into the Indian mining sector, therefore can be broadly classified in terms of:

1) Sales of total equipment, either directly or through local agents. This would be the case for exploration equipment, total mine management systems, mining electronics, and higher capacity shovels, dozers, and drills in the opencast mining equipment segment.

2) Technical transfer of technology or technical and financial collaboration with indigenous manufacturers. This would be in the case of equipment where economies of scale justify indigenous manufacture. Some import of components/sub-assemblies is likely to continue in this sector. This would include items like electricals and essential components in B&P and opencast mining equipment segments, and process control and monitoring systems in mining electronics.

Entry in association with a domestic manufacturer would, however, need to be assessed in greater detail interalia in terms of:

1) The product-market match in India of the technology and equipment suppliers, and
2) The strengths & weaknesses of the local collaborator.

In view of the above, potential strategies would need to be formulated by evaluating the strengths and weaknesses of the Canadian manufacturer, in conjunction with the domestic manufacturer's strategic intent and objectives.

The viable strategies to compete effectively in the mining equipment industry revolve around:

1) Ability to capitalize on the contacts, the image, and the reputation of the Indian collaborator, in terms of experience with the user segment, access to distribution channel network, and infrastructure like spares depots, repair centres, etc.
2) Attempt to differentiate equipment by introducing new add-on features for example — PRS with add-on features like electro-hydraulic controls and loads indicator.
3) Focus on high capacity equipment viz. 170T Dumpers and OB Drills above 150 mm.
4) Continuous market and technology development efforts, in terms of introduction of newer technologies that give better performance.
5) Technology development projects carried out in close association with consumers.

Canadian companies looking for business in this sector should use this document only as a general guide and should seek advice from the officials at the Canadian High Commission, New Delhi or at the Consulate of Canada, Bombay at the time of planning their visit to India.

PART II: FACTS AND FIGURES

ANNEXURE 1

INDIA'S MINERAL PRODUCTION VIS-A-VIS WORLD PRODUCTION (1987)

SR. NO.	MINERALS	PRODUCTION (in million tons)		INDIA's SHARE IN %
		WORLD	INDIA	
1.	Iron-ore	888	55.00	6.2
2.	Coal	3415	215.00	6.3
3.	Bauxite	87	3.00	3.4
4.	Copper ore	8	0.50	6.2
5.	Lead ore	3	0.30	10.0
6.	Zinc ore	7	0.50	0.7
7.	Manganese ore	24	1.20	5.0
8.	Chromite	10	0.60	6.0

SOURCE : CMIE publication — "World Economy and India's place in it", October 1988.

ANNEXURE 2

SHARE OF MAJOR MINERALS PRODUCED IN INDIA (EXCLUDING OIL) (1988)

(in Rs. millions)

SR. NO.	MINERALS	VALUE OF PRODUCTION (in Rs. mn)	(in CAN $ mn)	% OF TOTAL
1.	Coal	42980	3048	74.7
2.	Iron-ore	3450	245	5.9
3.	Limestone	2780	197	4.8
4.	Lignite	1810	128	3.1
5.	Copper ore	1160	82	2.0
6.	Chromite	910	65	1.6
7.	Gold	650	46	1.3
8.	Manganese ore	400	28	0.7
9.	Bauxite	590	42	1.0
10.	Phosphate	340	24	0.6
11.	Dolomite	150	150	0.3
12.	Gypsum	90	6	0.2
13.	Others	2210	157	3.8
	TOTAL	57520	4080	100.00

SOURCE : Government Publications

NOTE : 1 Canadian Dollar = Rs. 14.10

ANNEXURE 3

PRODUCTION TARGETS FOR MINING INDUSTRY

(in million tonnes)

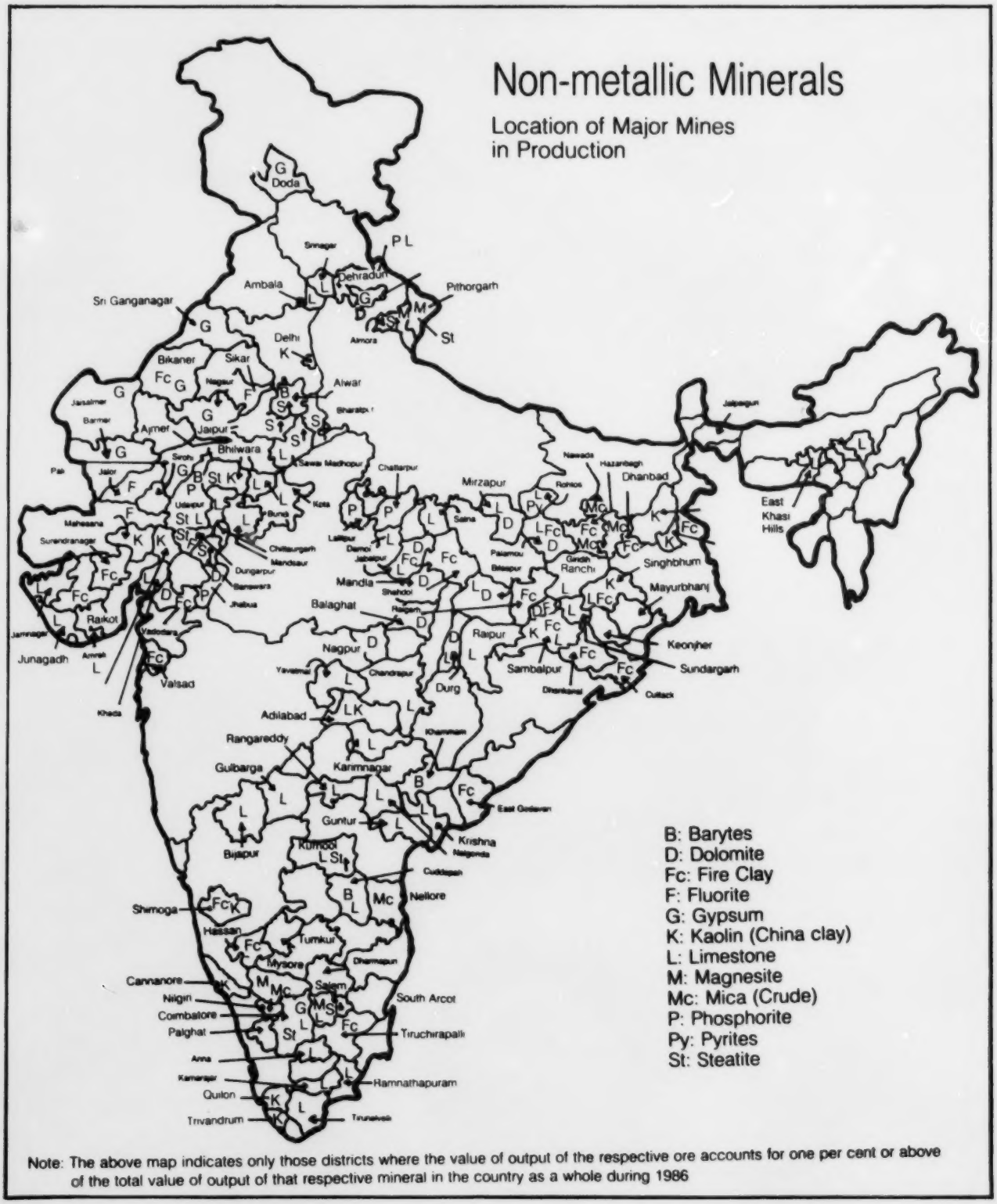
YEAR	COAL	METALLIFEROUS
1987 (Actuals)	187	122
1989-1990 (End VII Plan)	215	130
1994-1995 (End VIII Plan)	315	190
1999-0000 (End IX Plan)	411	N.A.

SOURCE : Government Publications

ANNEXURE 4

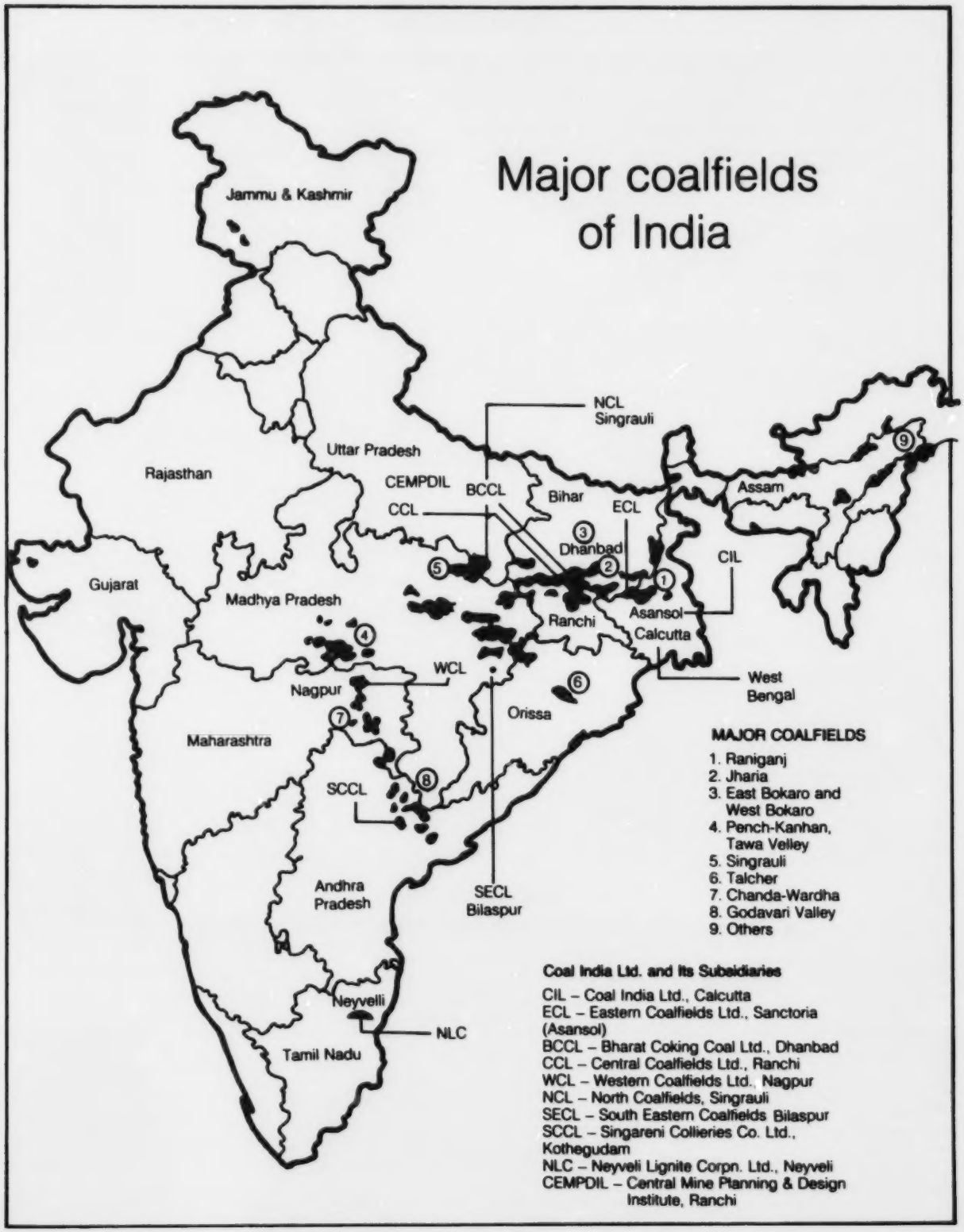
Note: The above map indicates only those districts where the value of output of the respective ore accounts for one per cent or above of the total value of output of that respective mineral in the country as a whole during 1986

ANNEXURE 5



Note: The above map indicates only those districts where the value of output of the respective ore accounts for one per cent or above of the total value of output of that respective mineral in the country as a whole during 1986

ANNEXURE 6


Major coalfields of India
Jammu & Kashmir
Rajasthan
Uttar Pradesh
CEMPDIL
BCCL
Bihar
ECL
CCL
NCL Singrauli
Assam
Dhanbad
CIL
Gujarat
Madhya Pradesh
Ranchi
Asansol
Calcutta
West Bengal
WCL
Nagpur
Orissa
Maharashtra
SCCL
Andhra Pradesh
SECL Bilaspur
Neyveli
NLC
Tamil Nadu
MAJOR COALFIELDS
1. Raniganj
2. Jharia
3. East Bokaro and West Bokaro
4. Pench-Kanhan, Tawa Velley
5. Singrauli
6. Talcher
7. Chanda-Wardha
8. Godavari Valley
9. Others
Coal India Ltd. and its Subsidiaries
CIL – Coal India Ltd., Calcutta
ECL – Eastern Coalfields Ltd., Sanctoria (Asansol)
BCCL – Bharat Coking Coal Ltd., Dhanbad
CCL – Central Coalfields Ltd., Ranchi
WCL – Western Coalfields Ltd., Nagpur
NCL – North Coalfields, Singrauli
SECL – South Eastern Coalfields Bilaspur
SCCL – Singareni Collieries Co. Ltd., Kothegudam
NLC – Neyveli Lignite Corpn. Ltd., Neyveli
CEMPDIL – Central Mine Planning & Design Institute, Ranchi

ANNEXURE 7

MAJOR SUPPLIERS OF ELECTROMAGNETIC EQUIPMENT IN INDIA

SR. NO.	EQUIPMENT	SUPPLIER	COUNTRY
1.	Transmitting Technology		
	(a) Continuous Wave	Geoprobe Ltd. Mephan	
	(b) Pulsed Wave	Geonics Crone	Canada
2.	Magnetometers		
	(a) Vertical field force	Scintrex EG & G Geomatrix Barringer Sanders	Canada
	(b) Total field force	Scintrex	Canada

SOURCE : Discussions with users

ANNEXURE 8

MAJOR SUPPLIERS OF SEISMIC EQUIPMENT IN INDIA

SR. NO.	EQUIPMENT	SUPPLIER	COUNTRY
1.	One/Two way channel systems	American Systems	U.S.A.
		SIE Geocourse	U.S.A.
		Century Corpn.	U.S.A.
		Heintec	Canada
2.	Multi-channel systems	Texas Instruments	U.S.A.
		Input-Output	U.S.A.
		Oyu Corpn.	Japan
		EG & G	Canada
		EDA Instruments	Canada
		Scintrex	Canada

SOURCE : Discussions with users

ANNEXURE 9

TRENDS IN GROWTH OF OPENCAST MINING (COAL) IN INDIA.

(In mn tons)

YEAR	ESTIMATED PRODUCTION	AVG. GROWTH OVER PREVIOUS PERIOD
1951	5	—
1961	11	8.5%
1971	17	4.7%
1981	51	11.6%
1986	95	13.3%
1987	112	17.9%

SOURCE : Government publications.

ANNEXURE 10

ESTIMATES OF FUTURE DEMAND FOR OPENCAST MINING MACHINERY (COAL) FOR INDIA.

(1990-91 TO 1994-95) (COAL)

SR. NO.	EQUIPMENT	PLANNING SUB-GROUP ESTIMATE			
		SANCTIONED PROJECTS	PROJECTS UNDER CONSIDERATION	TOTAL	CMPDIL ESTIMATE
1.	DRAGLINES			13	3
	24 CU.M/96 M, 31 CU.M/87 M	5	2	7	1
	20 CU.M/90 M, 15 CU.M/90 M	1	1	2	—
	10 CU.M/70 M	1	2	3	2
	6 CU.M/45 M	—	1	1	—
2.	ROPE SHOVELS			298	116
	20.0 CU.M/23.O CU.M	2	1	3	—
	12.5 CU.M/10.0 CU.M	34	30	64	41
	8.0 CU.M	29	—	29	—
	4.6 CU.M/ 5.0 CU.M	114	84	202	75
3.	HYDRAULIC SHOVELS			77	129
	11.0 CU.M	3	—	3	—
	8.0 CU.M/10.0 CU.M	1	—	1	2
	4.5 CU.M/ 5.5 CU.M	1	4	5	9
	2.3 CU.M/ 3.8 CU.M	40	28	68	118
4.	DUMPERS			2180	1346
	170 T	14	—	14	—
	110/120 T	47	4	51	42
	85 T	410	90	500	295
	50 T	286	96	382	87
	35 T	606	633	1239	922
5.	DRILLS			383	253
	311 MM/360 M	11	—	11	1
	250 MM	111	50	161	68
	150 MM/160 MM	133	73	206	139
	100 MM	—	5	5	45
6.	DOZERS			493	293
	250 HP/300 HP	164	100	264	231
	410 HP/415 HP	184	62	216	59
	600 HP	—	13	13	3
7.	BOTTOM DUP COAL HAULER (BDCH)		39	39	71
8.	MOTOR GRADERS				55
9.	SCRAPERS				40
10.	FRONT-END LOADERS				56
	5.0 CU.M — 7.0 CU.M				25

SR. NO.	EQUIPMENT	SANCTIONED PROJECTS	PROJECTS UNDER CONSIDERATION	TOTAL	CMPDIL ESTIMATE
	3.0 CU.M. — 4.0 CU.M				11
	1.5 CU.M — 3.0 CU.M				20
11.	CRANES				67
	70 T — 100 T				2
	50 T — 70 T				11
	30 T — 50 T				26
	5 T — 20 T				28

CMPDIL — Central Mine Planning & Design Institute

ANNEXURE 11

ESTIMATES OF FUTURE DEMAND FOR OPENCAST MINING MACHINERY (NON-COAL) FOR INDIA

(1990-91 TO 1994-95) (NON-COAL)

SR. NO.	EQUIPMENT	TOTAL
1.	DUMPERS	28
	DIESEL 2.0 CU.M	8
	ELECTRICAL 5.0 CU.M	5
	ELECT./HYD. 1.6 CU.M	5
	LOW PROFILE	10
2.	PNEUMATIC SHOVELS	5
3.	DRILLS	35
	HYDRAULIC	30
	TWIN BOOM	5
4.	HYDRAULIC BREAKERS	16
5.	CRANES (BELOW 50 KW)	9
6.	RAISE CLIMBER	2
7.	HIGH CAPACITY PUMPS	10

SOURCE : VIII Plan estimates.

ANNEXURE 12

ESTIMATES OF FUTURE MARKET FOR OPENCAST MINING EQUIPMENT (BY VALUE) FOR INDIA

(1990-91 TO 1994-95)

SR. NO.	EQUIPMENT	ESTIMATED DEMAND (IN NOS.)	(In Rs. mn.)	ESTIMATED DEMAND (In CAN$ mn.)
	COAL			
1.	DRAGLINES	13	3678	260
2.	ROPE SHOVELS	298	12710	900
3.	HYDRAULIC SHOVELS	76	876	60
4.	DUMPERS	2186	13088	930
5.	DRILLS	383	2645	190
6.	DOZERS	493	2673	190
7.	B D C H	39	218	15
8.	CRANES	67	345	25
	SUB-TOTAL		36233	2570

SR. NO.	EQUIPMENT	ESTIMATED DEMAND (IN NOS.)	(In Rs. mn.)	ESTIMATED DEMAND (In CAN$ mn.)
	NON — COAL			
9.	DUMPERS	28	12	0.85
10.	SHOVELS	5	4	0.3
11.	DRILLS	35	7	0.5
12.	BREAKERS	16	13	0.9
13.	CRANES	9	7	0.5
14.	OTHERS	12	4	0.3
	SUB-TOTAL		47	3.35
	TOTAL		36280	2573.35

Note : The above estimates are based on projected demand as assessed by the planning sub-group

ANNEXURE 13

SUPPLY SOURCES FOR MAJOR OPENCAST MINING MACHINERY IN INDIA

SR. NO.	EQUIPMENT		TYPE	SUPPLY SOURCE INDIGENOUS	IMPORTS
1.	Draglines	:	24/96, 31/89	HEC	USA/USSR
		:	20/90, 15/90	HEC	USSR
		:	10/70	HEC	USSR
		:	6/45	—	USSR
2.	Rope Shovels	:	20 cu.m, 23 cu.	—	IMPORTS
		:	12.5/10 cu.m	HEC/BEML	USA
		:	12.5/10 cu.m	HEC	USSR
		:	8 cu.m	—	USSR
		:	4.6/5 cu.m	HEC	USSR
3.	Hydraulic Shovels	:	11 cu.m	—	IMPORTS
		:	8-10 cu.m	—	IMPORTS
		:	4.5/5.5 cu.m	BEML/HM/L&T/HEC	—
		:	2.3/3.8	BEML/HM/L&T/HEC TELCO	—
4.	Dumpers	:	170 T	BEML/BHEL	
		:	110/120 T	BEML/BHEL	
		:	85 T	BEML/BHEL/HM	
		:	50 T	BEML/HM	
		:	35 T	BEML/HM	
5.	Drills	:	311/360 mm	—	IMPORTS
		:	250 mm	HEC/LMP/Revathi/IR	
		:	150/160	LMP/Revathi/IR LMP/IR	
6.	Dozers	:	200/300 HP	IR/HM	
		:	410/415 HP	BEML	
		:	650 hp	—	IMPORTS
7.	Bottom Dump Coal Haulers			BEML/HM	
8.	Scrapers			BEML	
9.	Graders			BEML/JEESOP	
10.	Front-End Loaders			HM/BEML	

ANNEXURE 14

DEMAND SUPPLY COMPARISONS OF MAJOR OPENCAST MINING MACHINERY IN INDIA

(1990-91 TO 1994-95)

SR. NO.	EQUIPMENT	TYPE	ESTIMATED DEMAND	ESTIMATED SUPPLY	EXCESS OF DEMAND OVER SUPPLY
1.	Draglines		13	10	GAP
2.	Rope Shovels	: 12.5/10 cum	64	60	GAP
		: 4.6/5 cum	202	120	GAP
3.	Hydraulic Shovels	: 4.5/10 cum	6	50	
		: 2.3/3.8	68	400	
4.	Dumpers		2186	3600	
5.	Drills	: 250 mm	161	200	
		: 150/160	206	200	GAP
		: 100 m	5	60	
6.	Dozers	: 250/300 hp	264	300	
		: 410/415	216		

NOTE :

1) Above figures are for a 5 years period (1990-91 to 1994-95)

2) Demand figures are based on projections of the planning sub-group.

ANNEXURE 15

FOREIGN COLLABORATORS OF MAJOR OPENCAST MINING MACHINERY MANUFACTURERS IN INDIA

SR. NO.	EQUIPMENT	CAPACITY	LOCAL MANF.	FOREIGN COLLABORATOR	MODEL
1.	Walking Dragline	24-32 cum 96-75 m	HEC	Ransom Rapier, U.K.	W-200
2.	Electric Rope Shovel	4.6/5 cum	HEC	U.S.S.R.	EKG 4-6
		10 cum	HEC	Bucyrus Erie, U.S.A.	195 B
		10 cum	BEML	Dressers, U.S.A.	182 M
3.	Hydraulic Shovel	0.9/3.2 cum	L&T	Poclain, France	90 CK/300 CK
		2.5 — 7.5 cum	HM	Demag, FRG	H36 — H121
		3.8 cum	BEML	Komatsu, Japan	PC — 650 — 3
			TELCO	Hitachi, Japan	
			BEML	Komatsu, Japan	PC-300/PC-220
4.	Diesel Rope Shovel	1.9/2.3 cum	HM	Terex, U.S.A.	93 M/101 M
		1.15 — 3.05 cum	TELCO	Hitachi, Japan	655B — 055B
5.	Rear Dumpers	25 T — 85 T	HM	Terex, U.S.A.	33 — 11C
		25 T — 85 T	BEML	Wabco, U.S.A.	33 — 11C
		25 T — 85 T	BEML	Wabco, U.S.A.	Haulpack
6.	Bottom Dump Coal Hauler	40 T	BEML	Wabco, U.S.A.	3050C
		60 T	HM	Terex, U.S.A.	H — 60 T
7.	Dozer	180 — 410 HP	BEML	Komatsu, Japan	D155A/D335/D80A
		275 HP	HM	Terex, U.S.A.	

SR. NO.	EQUIPMENT	CAPACITY	LOCAL MANF.	FOREIGN COLLABORATOR	MODEL
8.	Blast Hole Drills	243 — 269 mm	HEC	U.S.S.R.	SBSH — 250
		235 — 265 mm	IR	IR U.S.A.	IDM — 70 E
		229 — 269 mm	Ravathi	Consolidated Pneumatic U.S.A.	C — 750 E
		160 — 280 mm	LMP	Redrill, U.S.A.	SK/RBH
		160 — 200 mm	Revathi	CPT, U.S.A.	C — 650
		160 — 200 mm	IR	IR U.S.A.	IDM — 30
9.	Scraper	11.5 cum	BEML	N.A.	229 H
10.	Grader	145 HP	BEML	Komatsu, Japan	GD — 605
		145 HP	JESSOP	A. Barford, U.K.	GD — 605
11.	Front End Loaders	1.53 — 5.74 cu.m	HM	Terex, U.S.A.	72-21/72-71B
		1.6 — 4.5 cu.m	BEML	Komatsu, Japan	3035/1420

ANNEXURE 16

ESTIMATED IMPORT CONTENT OF MAJOR OPENCAST MINING MACHINERY IN INDIA

SR. NO.	EQUIPMENT	ESTIMATED CURRENT IMPORT CONTENT	LIKELY IMPORT CONTENT BY 1994-95
1.	Draglines	30%	0%
2.	Rope Shovels	70%	0%
3.	Dumpers : above 110 T	80%	0%
	Others	0%	0%
4.	Drills	N.A.	0%
5.	Dozers	30%	0%
6.	Front end Loaders	30%	0%

SOURCE : ESTIMATES BASED ON DISCUSSIONS WITH MACHINERY MANUFACTURERS AND ESTIMATES AND THE PLANNING SUB-GROUP.

NOTES : THE IMPORT CONTENT IN THE CASE OF THE ABOVE EQUIPMENT IS ONLY FOR INDIGENOUSLY MANUFACTURED ITEMS.

ANNEXURE 17

ESTIMATED IMPORTS OF OPENCAST MINING MACHINERY AND COMPONENTS IN INDIA

(In Rs. mn)

SR. NO.	EQUIPMENT TYPE	MACHINERY	ESTIMATED IMPORTS OF SUB-ASSEMBLIES	TOTAL
1.	Draglines	—	1076/141	1076
2.	Rope Shovels	293	3708	4001
3.	Dumpers : above 110 T	287	—	287
	Others	—	867	867
4.	Drills	407	—	407
5.	Dozers	128	763	891
6.	Hydraulic Shovels	183	208	391
	TOTAL	1389	6622	8011

ANNEXURE 18

TRENDS IN PRODUCTION THROUGH B&P MINING IN INDIA

(in mn. tons)

SR. NO.	YEAR	CONVENTIONAL	MECHANISED	TOTAL B&P	MECHANISED AS % OF TOTAL B&P
1.	1984-85	58.56	.95	59.51	2%
2.	1988-89	57.84	4.08	61.92	6%
3.	1994-95	37.79	15.84	73.63	22%
4.	1990-2000	54.53	23.54	78.07	30%

Source: Government publications

ANNEXURE 19

TRENDS IN USAGE OF BORD & PILLAR EQUIPMENT IN COAL MINES FOR INDIA

(in Nos.)

		POPULATION OF MACHINES				
					MECHANICAL VENTILATORS	
SR. NO.	YEAR	COAL CUTTING	MECHANICAL LOADERS	MECHANICAL CONVEYORS	BELOW G R O U N D	ABOVE
1.	1971	928	51	380	872	290
2.	1976	845	36	511	652	314
3.	1981	633	34	461	872	350
4.	1986	523	133	853	844	193
5.	1987	472	171	1009	867	200

SOURCE: DGMS publication

ANNEXURE 20

ESTIMATED POPULATION AND FUTURE DEMAND FOR MECHANISED BORD & PILLAR EQUIPMENT—COAL SECTOR FOR INDIA

				CUMMULATIVE DEMAND OVER VIII PLAN PERIOD V A L U E	
SR. NO.	EQUIPMENT	ESTIMATED CURRENT POPULATION IN NOS.	NUMBERS	(Rs. mn)	(In CAN $ mn)
1.	SDL	250	346	1210	86
2.	LHD	75	208	520	37
3.	ACD	10	34	95	7
4.	T O T A L			1825	130

SOURCE: Consultants estimates based on industry contacts and

NOTE: 1) The cummulative demand over the VIII five year plan is at current prices.
2) The VIII five year plan includes the period from 1990-91 to 1994-95.

ANNEXURE 21

ESTIMATES OF UNDERGROUND B & P EQUIPMENT REQUIREMENT—NON COAL SECTOR FOR INDIA

(VIII-Five Year Plan)

SR.NO.	EQUIPMENT	ESTIMATED REQUIREMENT IN VIII PLAN PERIOD
1.	LHDs—Diesel	8
2.	LHDs—Electrical	5
3.	LHDs—Electro—Hydraulic	5
4.	Pneumatic Rock Shovels	5
5.	Hydraulic Drills (57 mm dia up to 20m depth)	30
6.	Twin Boom Drill	5
7.	Low Profile Dumpers	10
8.	Hydraulic Rock Breakers	16
9.	Hoists/skips (upto 50 kw)	2
10.	Raise Climbers	2

SOURCE: Planning Sub Group
NOTE: VIII Plan period includes the years 1990-91 to 1994-95.

ANNEXURE 22

MAJOR MANUFACTURERS OF MECHANISED B & P EQUIPMENT IN INDIA

SR. NO.	EQUIPMENT	MANUFACTURER	COLLABORATOR
1.	SDL	Eimco Elecon Engg.	Tamrock, U.K., Eimco. U.K.
		Tata Robins Fraser Ltd. (TRF)	MAN, FRG.
		Tractors India Ltd. (TIL)	L'Equipment Minier, France.
		MAMC	USSR
2.	LHD	TIL Ltd	L'Equipment Minier, France
		TRF Ltd.	MAN, F.R.G.
		Eimco Elecon Engg.	Tamrock, U.K., Eimco, U.K.
3.	ACD	Vishwa Engg.	Perard Torque Tension Ltd., U.S.A.
		Atlas Copco	Atlas Copco, USA.
		Ingersoll Rand	Ingersoll Rand USA
		Eimco Elecon Engg.	Tamrock, U.K., Eimco, U.K.

ANNEXURE 23

TRENDS IN GROWTH OF LWF COAL PRODUCTION

(In mn. tons)

SR. NO.	YEAR	TOTAL COAL PRODUCTION	TOTAL PRODUCTION THROUGH U/G MINES	ESTIMATED LWF PRODUCTION	LWF AS A % AGE OF TOTAL U/G
1.	1971	77	59	0.8	1.4
2.	1976	105	76	1.1	1.5
3.	1981	27	76	0.9	1.2
4.	1986	170	75	2.7	3.6
5.	1987	187	75	2.5	3.3
6.	1989-1990	215	85	3.1	3.6
7.	1994-1995	315	110	10.8	9.8
8.	1999-2000	411	145	15.4	10.6

SOURCE: AFF estimates based on government statistics
NOTE: The estimated LWF production after 1989-1990 represents production estimates of CIL only.

ANNEXURE 24

PERCENTAGE BREAK-UP OF COST IN A LWF PACKAGE

SR. NO.	EQUIPMENT	TOTAL LANDED PRICE (in Rs. mn)	(in CDN $ mn)	% AGE OF TOTAL
1.	PRS 455OT	212	15.0	43
2.	Drum Shearer	97	7.0	20
3.	AFC 2 x 150 KW 150m	41	3.0	8
4.	Stage Loader 1 x 150 KW	12	0.9	2
5.	Lump breaker	5	0.4	1
6.	GTB conveyor	17	1.2	3
7.	Electricals including 2 gate & boxes, cables	36	2.6	7
8.	Ancilliary equipment for transporting, gas monitoring	9	0.6	2
9.	Spare parts	71	5.0	14
	T O T A L	500	35.50	100

SOURCE: Estimates based on discussion with users

NOTE: 1 Canadian $ = Rs. 14.10.

ANNEXURE 25

MANUFACTURING CAPACITY AND COLLABORATORS-LWF MANUFACTURERS

SR. NO.	MANUFACTURER	ESTIMATED CAPACITY CURRENT	VIII PLAN (5 YEARS)	COLLABORATOR
1.	MAMC	2	15	— Dowty, U.K. for PRS, Shearer and AFC — Hemschdir GMBH, WG for Roof Supports upto 561 seam thickness.
2.	Jessop & Co.	2	10	— Gullick, U.K. for PRS FRG firm for Shearer & AFC
3.	BEML	—	10	Mitsui Mike, Japan.
4.	Andhra Pradesh Heavy Machinery Engg. Ltd. (APHMEL)	—	8	USSR firm

SOURCE: Discussions with manufacturers.

ANNEXURE 26

FUTURE TRENDS IN UPGRADATION OF EQUIPMENT IN THE LONGWALL PACKAGE

EQUIPMENT	CURRENT RANGE	FUTURE RANGE
PRS	500 T	75 T with add on features like electro hydraulic controls & load indicator.
DRUM SHEARERS	315 KW	500/1000/KW with sophisticated control & monitoring system.
AFC	2*110 KW	115/180 KW with features like side dump and hydraulic chain systems etc.
ELECTRICALS		Higher voltage drive systems 3.3 KV micro processor monitoring system and radio control of face operations.

SOURCE: Consultants discussions with manufacturers.

ANNEXURE 27

TREND IN IMPORT CONTENT

SR. NO.	EQUIPMENT	1988-89	1994-95
1.	PRS	40%	10%
2.	AFC	50%	0.00% (FOR MEDIUM DUTY) 20% (FOR HEAVY DUTY)
3.	DRUM SHEARERS	75%	60%
4.	ELECTRICALS AS POWER PACK	100%	100%
5.	GTB CONVEYORS	30%	0.0%
6.	CRUSHERS/LUMP BROACHERS	100%	75.0%

SOURCE: Estimates and Planning Sub-Group.

ANNEXURE 28

MAJOR SUPPLIERS AND THEIR PRODUCT RANGE

SR. NO.	SUPPLIER	PRODUCT RANGE
1.	ITI, Bangalore	Loud Hailers, Telemonitoring equipment
2.	ECIL, Hyderabad	VHF system, CCTV etc..
3.	CEL, Shahibad	CDS, methanometer, Laser alignment
4.	Oldham, India	Telemonitoring systems.
5.	WBEID	VHS system, Leaky Feeder communication system, Inductive loop radio system underground mines, production monitoring etc.
6.	BHEL	Computer based telecontrol conveyor system, phyrister drives etc.
7.	UP Digital Systems	Microprocessor based telemonitoring and washeries automation system etc.
8.	Andrew Yule	Telemonitoring and other safety systems.

ANNEXURE 29

APPLICABLE TARIFF STRUCTURE FOR IMPORTS OF MINING MACHINERY IN INDIA

(In %)

SR. NO.	DESCRIPTION OF ARTICLE	RATE OF DUTY		
		BASIC	AUX.	CVD.
1.	Self-propelled bulldozers, angledozers, graders, levellers, scrapers, mechanical shovels, excavators, shovel loaders	50	45	15*
2.	Components for buckets, shovels, grabs, grips, bulldozer, or angledozer blades, and parts of boring or sinking machinery	40	45	15*
3.	Others	60	45	15*

SOURCE: Customs Tariff 1989-90 Budget edition.
BASIC: BASIC. Aux.: Auxillary.
CVD: Countervailing duty.
* plus 5% surcharge subject to frequent charges.

ANNEXURE 30

PRODUCT-WISE ANALYSIS OF COMPETITION IN DIFFERENT SECTORS OF THE MINING INDUSTRY IN INDIA

OPENCAST MINING EQUIPMENT

Major Equipment	Range	Competitive Analysis
Walking Draglines	24/96 & 6/45	* There is only one firm (HEC) in this segment Role of Draglines It is going to increase in the future as Dragline-Shovel-Dumper system is more productive
Hydraulic Shovels	5-15 (CU.M.)	* Major imports in this segment Indian manufacturers are catering to lower capacity segments
OB Drills	311-385 (MM.)	* 100% imports for drills above 300 MM * No manufacture exists in this segment * Market is clustered in lower capacity segment

BOARD & PILLAR MINING EQUIPMENT

Major Equipment	Range	Competitive Analysis
Load Haul Dumpers Side Dump Loaders Auger Cum Drills	Imports will be in the form of essential components	* Imports are likely to be bare minimum in this sector and there is possibility of small scale manufacturers flooding the market. Hence, this is not an attractive sector for any foreign company

LONGWALL FACE MINING EQUIPMENT

Major Equipment	Range	Competitive Analysis
Shield Support	500-750 (tons)	* Future imports will be in the form of essential components only. Excess capacity exists with Indian manufacturers already. LWF technology is not fully established in the Indian mining industry. Hence this is also not a very attractive segment for any foreign company. company.
Drum Shearers	315-500/1000 (KW)	
Road Headers	100-150 (KW)	
Armoured Face Conv.	190/222 & 2*110	
Electricals	Upto 3,3 (KV)	

EXPLORATION EQUIPMENT

MAJOR EQUIPMENT	RANGE	COMPETITIVE ANALYSIS
SEISMIC EQUIPMENT	Complete	* Major imports in this segment and some firms are well established
BORE-HOLE LOGGERS	Complete	* Entire equipment can be imported * High value-added products/equipment * Almost all equipment is 100% imported * Canadian firms have already established the performance of Canadian technology.

MINING ELECTRONICS

MAJOR EQUIPMENT	RANGE	COMPETITIVE ANALYSIS
TOTAL MINE MANAGEMENT	N.A.	* Major thrust by buyers in electronics * Tremendous growth anticipated * Domestic firms are still in the process of developing technology * Major emerging trend. * Demand Was Rs. 2000 MN. For the VII Plan period.
SYSTEMS OR MONITORING	"	
& CONTROL SYSTEMS	"	

ANNEXURE 31

PROFILE OF SELECTED POTENTIAL COLLABORATORS FOR MINING EQUIPMENT IN INDIA

BHARAT EARTH MOVERS LIMITED

Products manufactured:

Dozers, Wheel Loaders, Hydraulic Excavators/Mining Shovel Rear Dumpers, Bottom Dumpers, Tailers, Railcoaches, and others.

Company Profile:

Bharat Earth Movers Ltd. commenced operation on 1st January 1965 with the aim of manufacturing different ranges of heavy earthmoving equipment required in the Indian market. The Co. has manufactured equipment for defence, irrigation and power, mining of coal, iron ore and other minerals, road construction, land preparation for agriculture, soil conservation etc. The range of construction equipment manufactured by BEML and their quality compares favourably with those of other international manufacturers.

The company had a turnover of about Rs. 5.0 m. in the first year of its operations and in 1986-87 the sales turnover has reached Rs. 5070 m. BEML exports to over 16 countries in Asia, Africa, Europe and has been getting repeat orders. BEML has 3 modern manufacturing complexes at Kolar Gold Fields, Mysore and Bangalore where the latest machinery is installed. In addition, the company has a steel foundry at Tarikere.

Recently, the company has taken up manufacture of hydraulic and powerline components for defence and other sectors. BEML has established an R&D organisation and it has developed quality equipment such as wheel loaders, track shovels, towing tractors, heavy duty trailers etc. BEML proposes to increase its turnover to 1000 crores in 1990 by introducing a much wider range of quality products into the market.

EIMCO ELECON (INDIA) LIMITED

Products manufactured:

Rocker shovels, side dump loaders, load haul dumpers, crawler and wheel mounted auger machine, drill jumbo and roof bolting machines for mining, air motors & air winches.

Company Profile:

Eimco Elecon (India) Limited was established in 1974 as a joint venture between Elecon Engineering Co. Ltd., Gujarat and EIMCO, a division of Baker International, U.K. According to the terms of the agreement, Eimco, U.K. agreed to provide all technical know-how covering a broad range of underground equipment and also participated in the equity capital of the company.

The factory is located at Vallabh Vidyanagar near the sprawling Elecon complex and is provided with design, machining, assembly and testing facilities. Many of the machine tools are of the latest CNC type. Rigid quality control on raw materials and components is exercised and assembled machines are subject to rigorous testing to ensure they stand up to demands of underground mining application.

The company has already established R & D facilities and with the help of the experienced engineers developed compound airpowered hopper loaders which are successfully working in metal mines.

LARSEN & TOUBRO LIMITED

Products manufactured:

Mobile crushers, coal handling plant, coal washery, mineral benefication/processing plants, stationery crushers.

Company profile:

LARSEN & TOUBRO LIMITED is India's most diversified engineering organisation. Within a span of four decades, L & T has moved to leadership position in designing, manufacturing and installing plant and

equipment for vital industries. L & T also supports India's space programme by manufacturing rocket motor casings for satellite launch vehicles. The company's rapid growth in the last decade is attributed to a dynamic management team that is motivated by a new vision to go beyond traditional lines of business and seek opportunities for growth in diversification. L & T pioneered the manufacture of hydraulic excavators in India. Over 900 L&T-POCLAIN Hydraulic Excavators are in operation all over India. Hydraulic motor, pumps and cylinders are manufactured for excavators as well as for other industrial applications. Model TT900 vibratory compactors are also manufactured at L & T's Bangalore Works.

HEAVY ENGINEERING CORPORATION LTD.
(A Govt. of India Enterprise)

Products manufactured:

Mining & earth moving equipment:
Electrically operated crawler mounted quarry type excavators, walking draglines, 250 mm diameter blast hole drills, mine winders, stackers, reclaimers, wagon loaders and stacker-cum-reclaimers, hydraulic shovels, crushers-gyratory crushers, jaw crushers, cone crushers, hammer crushers and roll crushers.

Company profile:

Heavy Engineering Corporation Ltd., is a Govt. of India Enterprise having the following Units/Plants:

Foundry Forge Plant, Heavy Machine Building Plant, Heavy Machine Tools Plant, and Projects & Consultancy Division.

The first 3 are the manufacturing units engaged in design, manufacturing and supply of equipment and machine tools for core sector industries such as iron and steel, mining, energy, cement, fertilisers, petro-chemicals, ship building, ports and railways for example whereas the last unit is engaged in execution of turnkey projects in the field of crushing, sizing, material handling, low temperature carbonization etc. HEC's contributions in mining sector are:

Excavators, walking draglines, overburden drills, mine winder, crushers, consultancy services, and the supply of plant/projects on turnkey basis from concept to commissioning

Foreign Collaborations:

M/s. Ransomes & Rapier, U.K. M/s. Babcock Woodball Duckham, U.K. Bucyrus Erie Inc., USA, GHH Sterkraded GmbH, Orienstein, O & M Ltd., JAPAN, Hitachi Ltd., JAPAN, GEBR Boehringer GmbH, SMS-Schloeman Siemag GmbH. Prommashexport, USSR.

MACNEILL & MAGOR LIMITED (MINING DIVISION)

Products manufactured:

Belt conveyors, chain conveyors, mining chains, miner's caplamps & accessories, methanometric appliances, exploders, conveyor belting, mine electronification & control devices, flameproof electricals, mine pumps and coal handling plants.

Company profile:

Macneil & Magor Ltd., is one of the the leading organisations in the mining sector specialising in the supply and service of sophisticated mining equipment for last 4 decades. During this period the company has been a premier contributor to mine mechanisation and modernisation.

To cater to the rapid technological advancement in the field of mining, the company has entered into several technical collaborations.

The mining division's products are well known for quality, productivity and reliability. It has been progressively diversifying in the field of bulk material handling and a 10 MT capacity should use coal handling plant with weigh-in-motion has already been commissioned.

Backing manufacturing and marketing capabilities is a nation-wide after-sales-services network staffed with fully trained engineers.

MINING & ALLIED MACHINERY CORPORATION LTD

Products manufactured:

A) Mining Equipment:

Chain conveyor and stage loads, roof support and shearers, winders, fans, haulage pumps, coal drills, battery locomotives, coal cutting machines, load haul dumpers, side discharge loaders, auger cum drills.

B) All kinds of belt conveyors/feeders, wagon handling, stackers and reclaimers, wagon loaders, bucket elevators, gear boxes, cyclones and sieves boards, dry shale extractors, vibrating screens, salt scrapers, load jigs.

Company profile:

The Mining and Allied Machinery Corporation Ltd. (MAMC) was set up with Soviet collaboration in 1965 at Durgapur (W.B.). It is a complete unit having facilities like Paetn, iron and non-ferrous steel foundries, Fetting, forging, machine shop, Assl, shop, tool design, tool making, electroplating and heat treatment shops. Besides these, it has a modern design wing. Quality control, ancillary facilities and maintenance services are emphasised and there are separate works with machining, fabrication and assembly facilities at Nagpur.

With its modern engineering works, design and technical know-how MAMC is capable of manufacturing equipment for all major industries like mining, power, fertilizer and ports. MAMC is the largest manufacturer of mining, materials handling and coal washery equipment in India. MAMC, besides engineering and manufacturing, also undertakes erection and commissioning on turnkey basis in the field of mining, bulk materials handling and coal preparation.

TATA ENGINEERING & LOCOMOTIVE CO. LTD.

Products manufactured:

- Crawler mounted Tata-cranes, draglines, clamshells with angle latice booms.
- Tata-Hitachi hydraulic excavators in back-hoe and shovel executions.

Company Profile:

1954	TELCO commenced manufacture of vehicles at Jamshedpur Plant.
1959	Achieved production capacity of 500 vehicles per month.
1961	Production capacity increased to 1000 vehicles per month.
1965	Sale of excavators & cranes reaches 100 units.
1961	First 955A shovel rolls out of Jamshedpur Works.
1966	New plant at Pune commenced manufacture of vehicles.
1968	Production capacity increased to 2000 vehicles per month.
1970	Sale of vehicles reached 200,000 units.
1971	Sale of vehicles reached 300,000 units.
1978	Sale of vehicles reached 400,000 units.
1978	Sale of excavators and cranes reached 1,000 units.
1982	Sale of vehicles reached 500,000 units.
1983	Sale of excavators and cranes reached 1,500 units.
1985	Sale of vehicles crosses 600,000.
1985	Sale of excavators and cranes cross 1,800 units.
1985	Manufacture of TATA/HITACHI hydraulic excavator commences.

ANNEXURE 32

NAME & ADDRESSES OF MINING EQUIPMENT MANUFACTURERS IN INDIA

AIR COMPRESSOR

Atlas Copco (I) Ltd.,
Registered & Head Office :
Mahatma Gandhi Memorial Bldg., Netaji Subhas Road,
Bombay-400 002. Tel: 315623.

Elgi Equipments Ltd.,
'India House', Trichi Rd., Coimbatore-641 018.

Industrial & Mining Tools Company,
30, Chittaranjan Avenue, Calcutta-700 012.

Vishwanath Enterprises,
166, Muktaram Babu Street, Calcutta-700 007.

Consolidated Pneumatic Tools (I) Ltd.,
Registered & H.O.:
Post Box. 7761, 301/302, L.B.S. Marg, Mulund,
Bombay-400 080. Tel: 560 001.

Holman Climax Mfg., Ltd.,
Registered & Head Office :
Dolphin Court, 7A, Middleton Street,
Calcutta-700 071. Tel.: 29-1977/29-6615.

Ingersoll — Rand (I) Ltd.,
Registered & Head Office :
Maybaker House, S. K. Ahire Marg,
Bombay 400 025. Tel.: 66223.

AIR COOLING SYSTEM FOR MINES

Bharat Westfalia Ltd.,
Registered & Head Office :
16, Hare St., Calcutta 700 001.
Tel.: 20-9546/20/9548/20-9555.

ANEMOMETER

Asiatic Engineers (India)
33/1, N.S. Rd., Marshall Hse., (Rear Side),
Shop No. 108-B, P.B. No. 2792, Calcutta-1.

Nanda Millar Corporation,
Registered & Head Office :
32A, Chittaranjan Avenue, Calcutta-700 012.
Tel.: 27-0070/26-3530/31.

Nanda Manufacturing Company,
32, A.C.R. Avenue, Calcutta-700 012.

AUDIO — VISUAL ALARM

Gannon Dunkerly & Co. Ltd.
Chartered Bank Building, Fort, Bombay-400 001.

Mine Safety Appliances
Regd. & Head Office :
P-25, Transport Depot Road, Calcutta-700 088.
Tel.: 49 1707/45 9773/49 1657/45 6904.

Nanda Manufacturing Co.,
(Look under Anemometer)

Greaves Cotton & Co. Ltd.,
Regd. & H.O.:
1, Dr. V. B. Gandhi Marg, Bombay 400 023.
Tel.: 271524.

M. P. Engineering Works
24, Netaji Subhas Road,
Calcutta-700 001.

Rajiv Engineering Services
10, Phears Lane, Calcutta-12.

AUXILLARY FAN

Bharat Westfalia Ltd.
Regd. & Head Office :
16, Hare Street, Calcutta-700 001.
Tel: 20-9546/9548/9555.

Gannon Dunkerley & Co. Ltd.,
(Look under Audio-Visual Alaram)

Mining & Allied Machinery Corpn. Ltd.
Regd. & Head Office :
Durgapur 713 210, West Bengal.
Tel.: 5261 (Durgapur)

Vishwa Engineering Works,
Regd. & Head Office:
62-A, Hazra Road, Calcutta-700 019.

Calcutta Fan Works Ltd.
30, Chowringhee Road, Calcutta-700 016.

Greaves Cotton & Co. Ltd.,
(Look under Audio-Visual Alaram)

Voltas Limited,
Regd. & Head Office :
Volkart Bldg., 19, J.N. Heredia Marg, Ballard Estate,
Bombay 400 038. Tel.: 268131 (30 lines)

BATTERY LOCOMOTIVE

Bharat Westfalia Limited,
(Look under Auxillary Fan)

Mining & Allied Machinery Corporation Limited,
(Look under Auxillary Fan)

Greaves Cotton & Co. Ltd.,
(Look under Audio-Visual Alaram)

BELT CONVEYOR

Bharat Westfalia Ltd.
(Look under Auxillary Fan)

Gannon Dunkerley & Co. Ltd.
(Look under Audio-Visual Alarm)

Indian Paper Machinery & Engineering Works Ltd.
'Narayani', 27, Biplabi Trailakya Maharaj Sarani,
9th flr., Calcutta 700 001.

Macneill & Magor Ltd., (Mining Div.) Regd. Office :
4, Mangoe Lane, Calcutta-700 001. Tel.: 20-2391/3

Rampur Engg. Co. Ltd.,
20, Barakhamba Road, New Delhi-110 001.

Tata-Robins-Fraser Ltd.
Regd. & Head Office:
11, Station Road., Burma Mines,
Jamshedpur-831 007.
Tel.: 25246 (4 lines)
: 26175 (3 lines)

Vishwa Engg. Works.
(Look under Auxillary Fan)

Conveyor & Ropeway Services
75-C, Park Street, 6th floor, Calcutta-700 016.

Greaves Cotton & Co. Ltd.
(Look under Audio-Visual Alarm)

Jardine Henderson Ltd.
Regd. & Head Office :
4, Clive Row, Calcutta-700 001.
Tel.: 204351

McNally Bharat Engg. Co. Ltd.
Regd. Off.:
4, Mangoe Lane, Calcutta-700 001.
Tel.: 20 2391/28 6725/28 7350.

Sayaji Iron & Engg. Co. Pvt. Ltd.,
Chhani Road, Baroda-390 002.

Usha Breco Ltd.
Regd. & Head Office:
8, Chittaranjan Avenue, Calcutta 700 072.
Tel.: 275030 (3 lines)

BLAST HOLE DRILL MONITOR

Greaves Cotton & Co. Ltd.,
(Look under Audio-Visual Alarm)

Indian Drilling & Mining Co. Pvt. Ltd.,
7, Old Court Hosue Street, Calcutta-700 001.

BREAKER

McNally Bharat Engg. Co. Ltd.,
(Look under Belt Conveyor)

Tata-Robins-Fraser Ltd.,
(Look under Belt Conveyor)

Simplex Engg. & Foundry Works Pvt. Ltd.,
65, Industrial Estate, Bhilai-490 026 (M.P.)

BUCKET WHEEL EXCAVATORS

Bharat Earth Movers Ltd.,
Regd. & Head Office :
Unity Bldgs., Jayachamarajendra Rd.,
Bangalore-560 002. Tel.: 224141.

Kirloskar Electric Co. Ltd.,
Regd. & Head Office :
P.B. No. 5555, Malleswaram West,
Bangalore-560 055. Tel.: 357771, 359111.

MacNeill & Magor Ltd.
(Mining Divisin)
(Look under Belt Conveyor)

Ganon Dunkerley & Co. Ltd.,
(Look under Audio-Visual Alarm)

Heavy Engg. Corp. Ltd.,
Regd. & Head Office.:
Plant Plaza Rd., P.O. Dhurwa, Ranchi,
Bihar 834 004 (India) Tel.: 818/8176/8310

Larsen & Toubro Ltd.
Regd. & Head Office :
L & T House, Ballard Estate, P. Box. 278,
Bombay-400 038. Tel.: 268181.

CAP LAMP

MacNeill & Magor Ltd.
(Mining Div.)
(Look under Belt Conveyor)

The Miniature Bulb Industries Pvt. Ltd.,
131, Kanwali Rd., Dehra Dun (U.P.)-248 001.

Voltas Limited.
(Look under Auxillary Fan)

Mine Safety Appliances Ltd.,
(Look under Audio-Visual Alarm)

Standard Batteries Ltd.,
Head Office :
Vakola, Santacruz, Bombay 400 055.
Tel.: 612 9570 (6 lines)

CARBON MONOXOIDE DETECTOR & TUBE

Greaves Cotton & Co. Ltd.
(Look under Audio-Visual Alarm)

Mine Safety Appliances Ltd.
(Look under Audio-Visual Alarm)

Nanda Millar Co.
(Look under Anemometer)

Voltas Ltd.
(Look under Auxillary Fan)

MacNeill & Magor Ltd.
(Mining Div.)
(Look under Belt Conveyor)

Nanda Manufacturing Co.,
(Look under Anemometer)

Uptron India Limited,
10, Ashok Marg, Lucknow-226 001, (U.P.) India.

CHAIN CONVEYOR (LIGHT DUTY)

Bharat Westfalia Ltd.
(Look under Air Cooling System)

Indian Link Chain Manufacturers Limited.
Lal Bhadur Shastri Marg, Bandup, Bombay 400 078.

MacNeill & Magor Ltd.
(Mining Div.)
(Look under Belt Conveyor)

Perfect Spares Pvt., Ltd.
35, Purab Apartment, 42, Ridge Road, Walkeshwar,
Bombay-400 006.

Vishwa Engg. Works
(Look under Auxillary Fan)

Gannon Dunkerley & Co. Ltd.
(Look under Audio-Visual Alarm)

Indian Paper Machinery & Engg. Works Ltd.
(Look under Belt Conveyor)

Mining & Allied Machinery Corporation Ltd.,
(Look under Auxillary Fan)

Rampur Engg. Co. Ltd.
(Look under Belt Conveyor)

Voltas Ltd.
(Look under Auxillary Fan)

CHAIN CONVEYOR (MEDIUM DUTY)

Bharat Westifalia Ltd.
(Look under Air Cooling System)

Greaves Cotton & Co. Ltd.,
(Look under Audio-Visual Alarm)

The Indian Paper Machinery & Engg. Works Ltd.
(Look under Belt Conveyor)

Mining & Allied Machinery Corpn. Limited
(Look under Auxillary Fan)

Simplex Engg. & Foundry Works Pvt. Ltd.,
(Look under Breaker)

Voltas Limited
(Look under Auxillary Fan)

Gannon Dunkerley & Co. Ltd.,
(Look under Audio-Visual Alarm)

The Indian Link Chain Manufacturers
(Look under Chain Conveyor)

MacNeill & Magor Ltd.
(Mining Div.)
(Look under Belt Conveyor)

Rampur Engg. Co.
(Look under Belt Conveyor)

Vishwa Engg. Works
(Look under Auxillary Fan)

COAL CUTTING MACHINE

Greaves Cotton & Co. Ltd.
(Look under Audio-Visual Alarm)

Mining & Allied Machinery Corporation Limited.
(Look under Auxillary Fan)

Jardine Henderson Ltd.
(Look under Belt Conveyor)

Sayaji Iron & Engg. Co. Ltd.,
(Look under Belt Conveyor)

COAL HANDLING PLANT

Bharat Westfalia Ltd.
(Look under Air Cooling System)

Conveyor & Ropeway Services
(Look under Belt Conveyor)

Greaves Cotton & Co. Ltd.
(Look under Audio-Visual Alarm)

Hindustan Motors Ltd.,
Regd. & Head Office:
9/1, R.N. Mukherjee Road, Calcutta-700 001.

Larsen & Toubro Ltd.
(Look under Bucket Wheel Excavators)

Marshall Sons & Co., (I) Ltd.,
Chatterjee international Centre, 15th flr.,
33A, Chowringhee Road, Calcutta-7.

Mining & Allied Machinery Corporation Limited.
(Look under Auxillary Fan)

Rampur Engg. Co. Ltd.,
(Look under Belt Conveyor)

Sayaji Iron & Engg. Co., Ltd.,
(Look under Belt Conveyor)

Burn Standard Co. Ltd.
Regd. Office:
10-C Hungerfor Street, Calcutta-700 017.
Tel.: 44 1762/44 1788/44 1067

Gannon Dunkerley & Co. Ltd.
(Look under Audio-Visual Alarm)

Heavy Engg. Corp. Ltd.,
(Look under Bucket Wheel Excavators)

Jardine Henderson Ltd.
(Look under Belt Conveyor)

MacNeill & Magor Ltd.
(Mining Div.)
(Look under Belt Conveyor)

McNally Bharat Engg. Co. Ltd.
(Look under Belt Conveyor)

Radiant Engg. Ltd.,
Regd. & Head Office :
176, Acharya Jagdish Chandra Bose Rd.,
Calcutta 700 014. Tel.: 29/1256/294292/296755

R. N. Yadav & Co.,
Ram Bandhu Talab, G.T. Rd., (East), P.O. Asansol,
Dt. Burdwan, Pin-713 303.

Simplex Engg. & Foundry Works Pvt. Ltd.,
(Look under Breaker)

Tata-Robins-Fraser Ltd.
(Look under Belt Conveyor)

Ushamil Pvt. Ltd.
K-40, Connaught Circus, New Delhi-110 001.

Usha Breco Ltd.
(Look under Belt Conveyor)

Vishwa Engg. Works
(Look under Auxillary Fan)

COAL PLOUGH

Bharat Westfalia Ltd.
(Look under Air Cooling System)

COAL WASHERY

Conveyor & Ropeway Services
(Look under Belt Conveyor)

Heavy Engg. Corporation
(Look under Bucket Wheel Excavator)

MacNeill & Magor Ltd.
(Mining Div.)
(Look under Belt Conveyor)

Gannon Dunkerley & Co. Ltd.,
(Look under Audio-Visual Alarm)

Larsen & Toubro Ltd.
(Look under Bucket Wheel Excavator)

MacNally Bharat Engg. Co. Ltd.
(Look under Belt Conveyor)

Mining & Allied Machinery Corp. Ltd.
(Look under Auxillary Fan)

CONTINUOUS MINER

Greaves Cotton & Co. Ltd.
(Look under Audio-Visual Alarm)

Mining & Allied Machinery Corpn. Ltd.
(Look under Auxillary Fan)

Ingersoll-Rand (I) Ltd.,
(Look under Air Compressor)

CONVEYOR

Bharat Westfalia Ltd.
(Look under Air Cooling System)

Conveyor & Ropeway Services
(Look under Belt Conveyor)

Eimco Elecon (I) Ltd.
Regd. & Head Office :
Anand Sojitra Rd., Vallabh Vidyanagar,
Gujarat-388 120, India.
Tel.: 7420/7492/7687/7862/0268-8079.

Friends Engg. Works
8-9A, Industrial Estate, Pratap Nagar,
Udaipur-313 001.

Greaves Cotton & Co. Ltd.
(Look under Audio-Visual Alarm)

MacNeill & Magor Ltd.
(Mining Div)
(Look under Belt Conveyor)

Mining & Allied Machinery Corpn. Ltd.
(Look under Auxillary Fan)

Sayaji Iron & Engg. Co. Ltd.
(Look under Belt Conveyor)

Tata-Robins-Fraser Ltd.
(Look under Breaker)

Fenner India Limited
3, Madurai-Melakkai Road, Madurai-625 016.

Gannon Dunkerley & Co. Ltd.
(Look under Audio-Visual Alarm)

MaNally Bharat Engg. Co. Ltd.
(Look under Belt Conveyor)

Rampur Engg. Co. Ltd.
(Look under Belt Conveyor)

Standard Material Agencies
45/46, Podar Chambers, S.A. Brelvi Rd., Bombay-23.

Vishwa Engg. Works
(Look under Auxillary Fan)

CRANES

Bharat Earth Movers Ltd.
(Look under Bucket Wheel Excavators)

Heavy Engg. Corpn. Ltd.
(Look under Bucket Wheel Excavators)

Jessop & Co. Ltd.
63, Netaji Subash Rd.,
Calcutta 700 001. India.

Sayaji Iron & Engg. Co. Ltd.,
(Look under Belt Conveyor)

Greaves Cotton & Co. Ltd.
(Look under Audio Visual Alarm)

Hindustan Motors Ltd.
(Look under coal handling plant)

Marshall Sons & Co. (I) Ltd.,
(Look under coal handling plant)

Tata Engg. & Locomotive Co. Ltd.
Regd. Off.: Bombay House,
24, Homy Modi Street, Hutatma Chowk,
Bombay-400 001. Tel: 2049131/2048453

TIL Ltd.
Regd. & H.O. : 1, Taratolla
Rd., Garden Reach, Calcutta 700 024.

Voltas Ltd.
(Look under Auxillary Fan)

DIAMOND CORE DRILL

Greaves Cotton & Ltd.
(Look under Audio Visual Alarm)

Voltas Ltd.
(Look under Auxillary Fan)

LMP Precision Engg. Co. Pvt. Ltd.
Regd. & H.O.: P.B. No.7,
Mahadeo Nagar, Bilimora-396321 (G.S.)
Tel: 2411/2412

Indian Drilling & Mining Co. Pvt. Ltd.
7, Old Court House Street,
Calcutta - 700 001.

The Orient Engg. Co. Ltd.
118F, Dharamtala Street,
Moulali, Calcutta-700 013.

DIESEL LOCOMOTIVE

Bharat Westfalia Ltd.,
(Look under Air Cooling System)

Greaves Cotton & Co. Ltd.,
(Look under Audio Visual Alarm)

DIRECT HAULAGE

Conveyor & Ropeway Services
(Look under Belt Conveyor)

Jardine Henderson Ltd.,
(Look under Belt Conveyor)

Mining & Allied Machinery Corpn
(Look under Auxillary Fan)

Greaves Cotton & Co. Ltd.
(Look under Audio Visual Alarm)

McNally Bharat Engg. Co. Ltd.,
(Look under Belt Conveyor)

Vishwa Engg. Works
(Look under Auxillary Fan)

Voltas Ltd.
(Look under Auxillary Fan)

DREDGERS

Greaves Cotton & Co. Ltd.,
(Look under Audio Visual Alarm)

Indian Drilling & Mining Co Pvt. Ltd.
(Look under Diamond Core Drill)

DRIFTER

Ceco India
Laxmi Industrial Estate,
Bldg. No.1, 'B' Shed, New Link Rd.,
Andheri (West),
Bombay-400 058.

Industrial Mining Tools Co. Ltd.,
30, Chittaranjan Avenue,
Calcutta-700 012.

DRILL JUMBOS

Eimco Elecon (I) Ltd.,
(Look under Conveyor)

Ingersoll-Rand (I) Ltd.,
(Look under Air Compressor)

Vishwa Engg. Works.
(Look under Auxillary Fan)

Greaves Cotton & Co. Ltd.,
(Look under Audio Visual Alarm)

Mining & Allied Machinery Corpn. Ltd.,
(Look under Auxillary Fan)

DRILL RODS

Consolidated Pneumatic Tool Co. (I) Ltd.
(Look under Air Compressor)

Indian Drilling & Mining Co. Pvt. Ltd.
(Look under Air Compressor)

Ingersoll-Rand (I) Ltd.
(Look under Air Compressor)

LMP Precision Engg. Co. Ltd.,
(Look under Diamond Core Drill)

Rocktech Corporation
Shop No.17, Emrald House,
Sarojinidevi Rd.,
Secunderabad-500 003.

Greaves Cotton & Co. Ltd.,
(Look under Audio Visual Alarm)

Industrial Explosives Pvt. Ltd.,
Maimoon Chambers, Central Avenue,
Post Box No.352,
Gandhibaug, Nagpur-440002.

Jardine Henderson Ltd.,
(Look under Belt Conveyor)

The Orient Engg. Co. Ltd.,
(Look under Diamond Core Drill)

Vulcan Industrial Engg. Co. Pvt. Ltd.,
15, Dhanwantri Bhavan, 143-B,
August Kranti Marg, B'bay-36.

ENDLESS HAULAGE

Acharya Brothers
135, B.R.B. Basu Rd.,
(Canning St.) 3rd Flr.,
Calcutta-700 001.

Conveyor & Ropeway Services
(Look under Belt Conveyor)

Jardine Henderson Ltd.
(Look under Belt Conveyor)

Mining & Allied Machinery Corpn.
(Look under Auxillary Fan)

Voltas Ltd.
(Look under Auxillary Fan)

Bharat Westfalia Ltd.
(Look under Air Cooling System)

Greaves Cotton & Co. Ltd.,
(Look under Audio Visual Alarm)

McNally Bharat Engg. Co. Ltd.
(Look under Belt Conveyor)

Vishwa Engg. Works
(Look under Belt Conveyor)

EQUIPMENT NOISE CONTROL

Gannon Dunkerley & Co. Ltd.,
(Look under Audio Visual Alarm)

EXPLOSIVES

Eastern Explosives & Chemicals Ltd.,
P.O. Chinpai 731102.
Dist. Birbhum, West Bengal.

Karnataka Explosives Ltd.,
Chowgule House, 3rd Flr.,
No.18, Crescent Rd.,
Bangalore-560 001.

Noble Explochem Ltd.,
595/2, Giripeth,
Nagpur-440 010.

Indian Oxygen Ltd.
Regd. & H.O. OXYGEN HOUSE,
P43, Taratala Rd.,
Calcutta-700 088.

Maharashtra Explosives Ltd.,
Nirmal, 19th Flr., Nariman Point,
Bombay-400 021.

EXPLOSIVES LOADING TRUCKS (ANFO/SLURRY)

Anil Chemical Ltd.
J-18 M.I.D.C. Area,
Chikalthana,
Aurangabad-431210.

IBP Co. Ltd.,
Gillander House, 8, Netaji Subhas Rd.,
Calcutta-700 001.

Industrial Explosives Pvt. Ltd.,
Maimoon Chambers, Central Avenue,
P.B. No.352,
Gandhibaug, Nagpur-440 002.

Explogel India
123, Nanapeth, Pune-411 002.

IDL Chemicals Ltd.,
Kukatpally, Sanatnagar (IE) P.O.,
Hyderabad-500 018 (AP).

Primier Explosives Ltd.,
Godavari Explosives Pvt. Ltd.,
10-3-56/2/3, Radhakrishna Street,
Entrenchment Rd., East Maredpally,
Secunderabad-500 026. A.P.

Simplex Engg. & Foundry Works Pvt. Ltd.,
(Look under Breaker)

FACE PUMP

Greaves Cotton & Co. Ltd.,
(Look under Audio Visual Alarm)

MacNeil & Magor Ltd. (Mining Div.)
(Look under Belt Conveyor)

MP Engg. Works
24, Netaji Subhas Rd.,
Calcutta-700 001.

Kirloskar Electric Co. Ltd.,
(Look under Bucket Wheel Excavators

Mining & Allied Machinery Corpn. Ltd.
(Look under Auxillary Fan)

Usha Telehoist Ltd.,
Regd. Off.: 14 Princep St.,
Calcutta-700 072.
Tel: 27 2203, 27 7424.

FEEDER BREAKER

Bharat Westfalia Ltd.
(Look under Air Cooling System)

LMP Precision Engg. Co. Pvt. Ltd.
(Look under Diamond Core Drill)

McNallay Bharat Engg. Co. Ltd.,
(Look under Belt Conveyor)

TIL Ltd.
(Look under Cranes)

Ingersoll-Rand (I) Ltd.,
(Look under Air Compressor)

MacNeill & Magor Ltd., (Mining Div.)
(Look under Belt Conveyor)

Simplex Engg. & Foundry Works Pvt. Ltd.
(Look under Breaker)

FILTERS FOR AIR

Filtronic
68-B, Central Road,
Calcutta-700 032.

Indo Technolinks
B-16, Deepali, 92, Nehru Place,
New Dehli - 110 019.

Voltas Ltd.
(Look under Auxillary Fan)

F. Harley & Co. Pvt. Ltd.,
5, Rameshwar Shaw Road,
Calcutta-700 014.

Mine Safety Appliances Ltd.,
(Look under Audio Visual Alarm)

FIRE ALARM

Fireteck Systems
Chetak, XXXI/1017A, Vyttila Junction,
Cochin, Pin 682 019.

Mather & Platt (I) Ltd.
Udyog Bhavan, 29,
Walchand Hirachand Marg,
Ballard Estate,
Bombay 400 038.

Greaves Cotton & Co. Ltd.
(Look under Audio Visual Alarm)

Mine Safety Appliances Ltd.,
(Look under Audio Visual Alarm)

FIRE FIGHTING EQUIPMENT

Fireteck Systems
(Look under Fire Alarm)

Mather & Platt (I) Ltd.
(Look under Fire Alarm)

Greaves Cotton & Co. Ltd.,
(Look under Audio Visual Alarm)

Mine Safety Appliances Ltd.
(Look under Audio Visual Alarm)

FLP MOTOR

Bhangar Brothers,
111, Atlanta, Nariman Pt.
Bombay-400 021.

Bharat Heavy Electricals Ltd.,
Regd. Off.: BHEL House,
Siri Fort, New Delhi-110 049.

Mather & Platt India Ltd.,
(Look under Fire Alarm)

Bharat Bijlee Ltd.
Electric Mansion, 6th Flr.,
Appasaheb Marather Marg,
Prabhadevi, B'bay-400 025.

Kirloskar Electric Co. Ltd.,
(Look under Bucket Wheel Excavator)

Rajendra Electrical Industries Ltd.,
14, Shah Industrial Estate,
Veera Desai Road, Andheri (W),
Bombay-400 058.

FLP PLUG & SOCKET

Jardine Henderson Ltd.,
(Look under Belt Conveyor)

MacNeill & Magor (Mining Div.)
(Look under Belt Conveyor)

Volga Engg. Co. Pvt. Ltd.,
75-C, Park Street, 6th Flr.,
'E' Block, Calcutta-700 016.

MacNeill & Magor
(Kilburn Electrical Group),
34/1, Diamond Harbour Rd.,
Calcutta-700 027.

Vishwanath Enterprises,
166, Muktaram Babu Street,
Calcutta-700 016.

FLP TRANSFORMER

Bharat Bijlee Ltd.,
(Look under FLP Motor)

Kirloskar Electric Co.
(Look under Bucket Wheel Excavator)

Volga Engg. Co. Pvt. Ltd.,
(Look under FLP Plug Socket)

Jardine Henderson Ltd.,
(Look under Belt Conveyor)

MacNeill & Magor Ltd.,
(Kilburn Electrical Group)
(Look under FLP Plug & Socket)

FRICTION PROPS

Bharat Westfalia Ltd.,
(Look under Air Cooling System)

Mining & Allied Machinery Corpn. Ltd.,
(Look under Auxillary Fan)

Burma Engg. Works,
Bhuli Rd., Dhanbad-828 001.

MP Engg. Works,
(look under Face Pump)

GRIZZLY

Conveyor & Ropeway Services
(Look under Belt Conveyor)

Heavy Engg. Corpn. Ltd.,
(Look under Bucket Wheel Excavator)

Gannon Dunkerley & Co. Ltd.,
(Look under Audio Visual Alarm)

Radiant Engg. Industries
(Look under Coal Handling Plant)

HYDRAULIC COMPONENTS

Asiatic Engineers (India),
33/1, N.S. Rd., Marshall House,
(Rear Side), Shop No.108-B,
P.B. No.2792, Calcutta-700 001.

Fenner India Ltd.,
(Look under Conveyor)

LMP Precision Engg. Co. Pvt. Ltd.,
(Look under Diamond Core Drill)

Usha Telehoist Ltd.,
(Look under Face Pump)

Bharat Westfalia Ltd.,
(Look under Air Cooling System)

Greaves Cotton & Co. Ltd.,
(Look under Audio Visual Alarm)

Perfect Spares Pvt. Ltd.,
35, Purab Apartment,
42, Ridge Rd., Walkeshwar,
Bombay-400 006.

HYDRAULIC CYLINDERS

Asiatic Engineers (India)
(Look under Hydraulic Components)

Greaves Cotton & Co. Ltd.,
(Look under Audio Visual Alarm)

Perfect Spares Pvt. Ltd.,
(Look under Hydraulic Components)

Bharat Westfalia Ltd.,
(Look under Air Cooling System)

LMP Precision Engg. Co. Pvt. Ltd.,
(Look under Diamond Core Drill)

Usha Telehoist Ltd.,
(Look under Face Pump)

HYDRAULIC PROPS

Bharat Westfalia Ltd.,
(Look under Air Cooling System)

Mining & Allied Machinery Corpn. Ltd.,
(Look under Auxillary Fan)

Jessop & Co. Ltd.,
(Look under Cranes)

Usha Telehoist Ltd.,
(Look under Face Pump)

IDLER ROLLER

Bharat Westfalia Ltd.,
(Look under Air Cooling System)

Engineering Complex of India,
27, Weston Street, 2nd Flr.,
R.N. 205, Calcutta-700 012.

Greaves Cotton & Co. Ltd.,
(Look under Audio Visual Alarm)

Indian Paper Machinery & Engg. Works Ltd.,
(Look under Belt Conveyor)

Khandelwal Industries
Naya Bazar, Dhanbad-828111.

MacNeill & Magor Ltd., (Mining Div.)
(Look under Belt Conveyor)

Mining & Allied Machinery Corpn. Ltd.,
(Look under Auxillary Fan)

Radiant Engg. Industries (P) Ltd.,
(Look under Coal Handling Plant)

Tata-Robins-Fraser Ltd.,
(Look under Belt Conveyor)

Vir Industries,
Bastacolla, Gaushala Rd.,
P.O. Dhansar, Dhanbad.

Conveyor & Ropeway Services,
(Look under Belt Conveyor)

Gannon Dunkerley & Co. Ltd.,
(Look under Audio Visual Alarm)

Garden Reach Shipbuilders & Engineers Ltd.,
Regd. & H.O.: 43/46, Garden Reach Road,
Calcutta-700 024.

Kali MHS Pvt. Ltd.,
42/6-B, Madras Road,
Melakaveri-612 002,
Kumbakonam.

Kirloskar Electric Company Ltd.,
(Look under Bucket Wheel Excavator)

Manoj Industries
20/21B, Kandra Industrial Area,
P.O. Govindpur (Dhanbad).

MP Engg. Works,
(Look under Face Pump)

R.N. Yadav & Co.,
(Look under Coal Handling Plant)

Varsa Industries,
7, Indrayani, Ramdaspeth,
Nagpur-440 010.

Vishwa Engineering Works,
(Look under Auxillary Fan)

JACK HAMMER

Ceco India
(Look under Drifter)

Holman Climax Manufacturing
Regd. & H.O.: Dolphin,
Court 7A, Middleton Street,
Calcutta-700 071.

Ingersoll-Rand (I) Ltd.,
(Look under Air Compressor)

Consolidated Pneumatic Tool Co. (I) Ltd.,
(Look under Air Compressor)

Industrial Mining Tools Co.,
(Look under Drifter)

Jardine Henderson Ltd.,
(Look under Belt Conveyor)

JAW CRUSHER

Marshall Sons & Co. (I) Ltd.,
Chatterjee International Centre,
15th Flr., 33A Chowringhee Road,
Calcutta-700 071.

LINK BARS

Bharat Westfalia Ltd.,
(Look under Air Cooling System)

Mining & Allied Machinery Corpn. Ltd.,
(Look under Auxillary Fan)

United Engg. Co.,
40, Strand Rd., 2nd Flr.,
Room No.43 B, Calcutta-700 001.

Burma Engg. Works,
(Look under Friction Props)

Nanda Millar Co.,
(Look under Anemometer)

MANOMETER

Asiatic Engineers (India)
(Look under Hydraulic Components)

Nanda Millar Co.,
(Look under Anemometer)

Nanda Manufacturing Co.,
(Look under Anemometer)

MAN RIDING HAULAGE

Bharat Westfalia Ltd.,
(Look under Air Cooling System)

Greaves Cotton & Co.,
(Look under Audio Visual Alarm)

Mining & Allied Machinery Corpn. Ltd.,
(Look under Auxillary Fan)

Simplex Engg. & Foundry Works (P) Ltd.,
(Look under Breaker)

Conveyor & Ropeway Services,
(Look under Belt Conveyor)

Jardine Henderson Ltd.,
(Look under Belt Conveyor)

Radiant Engg. Industries,
(Look under Coal Handling Plant)

Vishwa Engg. Works,
(Look under Auxillary Fan)

MATERIALS CAR

Bharat Westfalia Ltd.,
(Look under Air Cooling System)

Simplex Engg. & Foundry Works (P) Ltd.,
(Look under Breaker)

Greaves Cotton & Co.,
(Look under Audio Visual Alarm)

MECHANICAL LOADERS

Bharat Earth Movers Ltd.,
(Look under Bucket Wheel Excavator)

Tata-Robins Fraser Ltd.,
(Look under Belt Conveyor)

Explogel India,
123, Nanapeth, Pune-411 002.

METHANE ALARM

Greaves Cotton & Co. Ltd.,
(Look under Audio Visual Alarm)

Mine Safety Appliances Ltd.,
(Look under Audio Visual Alarm)

MacNeill & Magor Ltd., (Mining Div.)
(Look under Belt Conveyor)

Voltas Ltd.,
(Look under Auxillary Fan)

MINE CAR

Acharya Brothers,
(Look under Endless Haulage)

Burma Engg. Works,
(Look under Friction Props)

Friends Engg. Works,
(Look under

Mining & Allied Machinery Corpn. Ltd.,
(Look under Auxillary Fan)

Bharat Westfalia Ltd.,
(Look under Air Cooling System)

Burn Standard Co. Ltd.,
(Look under Coal Handling Plant)

Khandelwal Industries,
(Look under Idler Roller)

Simplex Engg. & Foundry Works Pvt. Ltd.,
(Look under Breaker)

MINERAL BENEFICIATION/ PROCESSING PLANTS

Conveyor & Ropeway Services,
(Look under Belt Conveyor)

Gannon Dunkerley & Co. Ltd.,
(Look under Audio Visual Alarm)

MacNeill & Magor Ltd., (Mining Div.),
(Look under Belt Conveyor)

Simplex Engg. & Foundry Works (P) Ltd.,
(Look under Breaker)

Tata-Robbins-Fraser Ltd.,
(Look under Belt Conveyor)

Eimco KCP Ltd.,
'Ramakrishna Bldgs', No.2,
Victoria Crescent Rd.,
P.B. No.6815, Madras 600 105.

Larsen & Toubro Ltd.,
(Look under Bucket Wheel Excavator)

Mining & Allied Machinery Corpn. Ltd.,
(Look under Auxillary Fan)

Sunbeam Engg. Works,
150, Betwan Bazar,
Post & Dist. Monghyr, (Bihar),
Pin-811 201.

Tega India Ltd.,
Regd. & H.O.: P-40,
Block & 'B', New Alipore,
Calcutta-700 053.
Tel: 45 7820/45 7630.

Texmaco Ltd.,
Regd. Off.: Belgharia,
Calcutta-700 056.
Tel: 581631/581722/582416/581672/581713/582388.

MINE TELEPHONE

Andrew Yule & Co. Ltd.,
Regd. & H.O.: 8, Clive Row,
Calcutta-700 001. Tel: 258210.

Mine Safety Appliances Ltd.,
(Look under Audio Visual Alarm)

Greaves Cotton & Co. Ltd.,
(Look under Audio Visual Alarm)

Uptron India Ltd.,
10, Ashok Marg,
Lucknow-226001. (UP). India.

MOBILE CRUSHER

Bharat Westfalia Ltd.,
(Look under Air Cooling System)

Hyderabad Industries Ltd.,
Sanathnagar, Hyderabad-500 018.

McNally Bharat Engg. Co. Ltd.,
(Look under Belt Conveyor)

Greaves Cotton & Co. Ltd.,
(Look under Air Cooling System)

Larsen & Toubro Ltd.,
(Look under Bucket Wheel Excavator)

Sayaji Iron & Engg. Co. Ltd.,
(Look under Belt Conveyor)

MOBILE ROCKBREAKER

Bharat Westfalia Ltd.,
(Look under Air Cooling System)

Karnataka Rockdrill Pvt. Ltd.,
30/1, Cunningham Rd.,
Bangalore-560 052.

Sunbeam Engg. Works,
(Look under Mineral Benefication Plant)

Ingersoll-Rand (I) Ltd.,
(Look under Air Compressor)

McNally Bharat Engg. Co. Ltd.,
(Look under Belt Conveyor)

(TELE) MONITORING SYSTEM

Andrew Yule & Co. Ltd.,
(Look under Mine Telephone)

Uptron India Ltd.,
(Look under Mine Telephone)

Mine Safety Appliances Ltd.,
(Look under Audio Visual Alarm)

OHM METER

Andrew Yule & Co. Ltd.,
(Look under Mine Telephone)

Intek,
35, Gandhi Rd., Dehradun.

Nandi Millar Co.,
(Look under Anemometer)

Industrial Explosives Pvt. Ltd.,
(Look under

Nanda Manufacturing Co.,
(Look under Anemometer)

PRIMARY CRUSHER

Bharat Westfalia Ltd.,
(Look under Air Cooling System)

Heavy Engg. Corpn. Ltd.,
(Look under Bucket Wheel Excavator)

Mining & Allied Machinery Corpn. Ltd.,
(Look under Auxillary Fan)

Sayaji Iron & Engg. Co. Pvt. Ltd.,
(Look under Belt Conveyor)

Tata-Robins-Fraser Ltd.,
(Look under Belt Conveyor)

Greaves Cotton & Co. Ltd.,
(Look under Audio Visual Alarm)

McNally Bharat Engg. Co. Ltd.,
(Look under Belt Conveyor)

Radiant Engg. Industries (P) Ltd.,
(Look under Coal Handling Plant)

Sunbeam Engg. Works,
(Look under Mineral Benefication Plant)

PROP SETTING DEVICE

Greaves Cotton & Co. Ltd.,
(Look under Audio Visual Alarm)

Nanda Millar Co.,
(Look under Anemometer)

Micon Engineers Ltd.,
25, Netaji Subhas Rd.,
Ground Flr., Calcutta-700 001.

PULLEYS/SHEAVES

Garden Reach Shipbuilders & Engineers Ltd.,
(Look under Ideler Roller)

The Orient Engg. Co.,
118F, Dharamtala Street,
Moulali, Calcutta-700 013.

Rampur Engg. Co. Ltd.,
(Look under Belt Conveyor)

Jessop & Co. Ltd.,
(Look under Cranes)

Min Mech Engg. Co.,
Regd. & H.O.: 8, Lansdowne Terrace,
Calcutta-700 026.

Radiant Engg. Industries,
(Look under Coal Handling Plant)

Tata-Robbinsons-Fraser Ltd.,
(Look under Belt Conveyor)

PUMP ACCESSORIES

Equipment & Spares Corpn.,
40, Strand Rd., 3rd Flr.,
Calcutta-700 001.

Kirloskar Brothers Ltd.,
Udyog Bhavan, Tilak Rd.,
Pune-411 002.

LMP Precision Engg. Co. Ltd.,
(Look under Diamond Core Drill)

Mather & Platt. (I) Ltd.,
(Look under Fire Alarm)

The Orient Engg. Co.,
(Look under Pulleys/Sheas)

Varsa Industries.,
(Look under Idler Roller)

Khandelwal Industries,
(Look under Idler Roller)

Kishore Pumps Pvt. Ltd.,
A-13/H, MIDC Indl. Area,
Pimpri, Pune-411 018.

MacNeill & Magor Ltd., (Mining Div.),
(Look under Belt Conveyor)

MP Engg. Works,
(Look under Face Pump)

Sigil India Services Pvt. Ltd.,
381, Dr. Dadabhai Nowroji Rd.,
P.B. No.952, Fort, B'bay-400 001.

Water Supply Specialists Pvt. Ltd.,
(WASP PUMPS),
8, Ambalal Doshi Marg, Fort,
Bombay-400 023.

PUMPS

B.E. Pumps Pvt. Ltd.,
4, B.B.D. Bag East,
Calcutta-700 001.

Chemineers,
6, Jagnath Plot,
Rajkot-360 001. (Guji.)

Greaves Cotton & Co. Ltd.,
(Look under Audio Visual Alarm)

Kirloskar Brothers Pvt. Ltd.,
(look under Pump Accessories)

LMP Precision Engg. Co. Pvt. Ltd.,
(Look under Diamond Core Drill)

Mather & Platt (I) Ltd.,
(Look under Fire Alarm)

Mody Industries (FC) Pvt. Ltd.,
85/95-B, Mittal Court,
Nariman Point, B'bay-400 021.

Roto Pumps & Hydraulics Pvt. Ltd.,
162-B, Co-operative Indl. Estate,
Kanpur-208 022.

Udeyraj & Sons,
Readymoney Terrace,
167, Dr. Annie Besant Rd.,
Worli, Bombay-400 018.

Usha Telehoist Ltd.,
(Look under Face Pump)

Water Supply Specialists Pvt. Ltd.,
(look under Pump Accessories)

Bhangar Brothers & Co. Pvt. Ltd.,
(Look under FLP Motor)

Emico Elecon (India) Ltd.,
Regd. & H.O.: Anand Sojitra Rd.,
Vallabh Vidyanagar,
Gujarat: 388 120. India.
Tel: 7420/7492/7687/7862/0268-8079.

Indian Drilling & Mining Co. Pvt. Ltd.,
(Look under Diamond Core Drill)

Kishore Pumps Pvt. Ltd.,
(look under Pump Accessories)

MacNeil & Magor Ltd., (Mining Div.),
(Look under Belt Conveyor)

Mining & Allied Machinery Corpn. Ltd.,
(Look under Auxillary Fan)

The Orient Engg. Co.,
(Look under Pulleys/Sheases)

Sigil (I) Services Pvt. Ltd.,
(Look under Pump Accessories)

Upaj Engg. Pvt. Ltd.,
Adjacent to GIDC, Plot No.2,
On Naroda National Highway Odhav,
Ahmedabad-382 415.

Voltas Ltd.,
(Look under Auxillary Fan)

RESUSCITATION APPARATUS

Industrial Medical Engineers,
Caxton House, 2E Rani Jhansi Road,
Jhandewalan, P.B. No. 5706,
New Delhi-110 055.

Mine Safety Appliances Ltd.,
(Look under Audio Visual Alarm)

United Engineering Co.,
40, Strand Rd., 2nd Flr.,
Room no.43 B, Calcutta-1.

ROCKBREAKER

Consolidated Pneumatic Tool Co (I) Ltd.,
(Look under Air Compressor)

McNally Bharat Engg. Co. Ltd.,
(look under Breaker)

Simplex Engg. & Foundry Works (P) Ltd.,
(Look under Breaker)

Ingersoll-Rand (I) Ltd.,
(look under Air Compressor)

Rampur Engg. Works,
(Look under Belt Conveyor)

Tata Engg. & Locomotive Co. Ltd.,
(Look under Cranes)

ROOF BOLTING ACCESSORIES

Ingersoll-Rand (I) Ltd.,
(Look under Air Compressor)

Khandelwal Industries,
(Look under Idler Roller)

Nanda Manufacturing Co.,
(Look under Anemometer)

United Engg. Co.,
40, Strand Rd., 2nd Flr.,
Room No.43, B. Calcutta-1.

Jardine Henderson Ltd.,
(Look under Belt Conveyor)

Mand Valley Mineral Pvt. Ltd.,
(Mining Accessories Division),
1062, "Sheel Niwas", 2nd Flr.,
West High Court Road,
Nagpur-440 010.

Nanda Millar Co.,
(Look under Anemometer)

Vishwa Engg. Works,
(Look under Auxillary Fan)

ROOF BOLTING MACHINE

Eimico Elecon (I) Ltd.,
(Look under Conveyors)

Ingersoll-Rand (I) Ltd.,
(Look under Air Compressor)

Usha Telehoist Ltd.,
(Look under Face Pump)

Indian Drilling & Mining Co. Pvt. Ltd.,
(look under Diamond Core Drill)

Jardine Henderson Ltd.,
(Look under Belt Conveyor) .

Vishwa Engg. Works,
(Look under Auxillary Fan)

ROOF BOLTS

Burma Engg Works,
(Look under Friction Props)

Engineering Complex of India,
27, Weston Street, 2nd Flr.,
R.N. 205, Calcutta-700 001.

Jardine Henderson Ltd.,
(look under Belt Conveyor)

Min Mech Engg. Co.,
(Look under Pulleys/Sheases)

Nanda Manufacturing Co.,
(look under Anemometer)

RK Enterprises,
G.T. Rd. (West), Neamatpur,
Dist.: Burdwan-713 359.
West Bengal.

United Engg. Co.,
(Look under Roof Bolting Accessories)

Emar (I) Pvt. Ltd.,
135, Biplabi Rash Behari Basu Rd.,
Calcutta-700 001.

Ingersoll-Rand (I) Ltd.,
(Look under Air Compressor)

Micon Engineers,
(look under Prop Setting Devia)

MP Engg. Works,
(Look under Face Pump)

Nanda Millar Co.,
(Look under Anemometer)

Soney Enterprises,
North Ichapur Rd. (Sasti Bagan),
Howrah-4.

Varsa Industries,
(Look under Idler Roller)

SAFARI SUPPORT

Acharya Brothers
(Look under Endless Haulage)

Khandelwal Industries
(Look under Idler Roller)

Manoj Industries
(Look under Idler Roller)

Mining & Allied Machinery Corpn. Ltd.
(Look under Auxillary Fan)

Nanda Manufacturing Co.
(Look under Anemometer)

R.N. Yadav & Co.
(Look under Coal Handling Plant)

Varsa Industries
(Look under Idler Roller)

Burma Engg. Works
(Look under Friction Props)

Mand Valley Mineral Pvt. Ltd.
(Look under Roof Bolting Accessories)

Micon Engineers
(Look under Friction Props)

MP Engg. Works
(Look under Face Pump)

R.K. Enterprises
(Look under Roof Bolts)

Soney Enterprises
(Look under Roof Bolts)

Vir Industries
(Look under Idler Roller)

SAFETY BELT

Nanda Manufacturing Co.,
(Look under Anemometer)

United Engg. Co.
(Look under Roof Bolting Accessories)

Nanda Millar Co.
(Look under Anemometer)

SAFETY BOOT

East India Industrial Corpn.
27, Weston Street, Room No. 214, Calcutta-700 012.

Fireteck Systems
(Look under Fine Alarm)

SAFETY GOGGLES

East India Industrial Corpn.
(Look under Safety Boot)

Nanda Manufacturing Co.,
(Look under Anemometer)

Fireteck Systems
(Look under Fine Alarm)

United Engg. Co.
(Look under Roof Bolting Accessories)

SAFETY HELMET

Concord Arai Pvt. Ltd.
Old Mahabalipuram Rd., Mettukuppam,
P.B. No. 5053, Madras-600 096.

Fireteck Systems
(Look under Fine Alarm)

Mine Safety Appliances Ltd.,
(Look under Audio Visual Alarm)

East India Industrial Corpn.
(Look under Safety Boot)

Industrial Explosives Pvt. Ltd.
(Look under Explosives Loading Trucks)

Voltas Ltd.,
(Look under Auxillary Fan)

SCREENING EQUIPMENT

Bharat Westfalia Ltd.
(Look under Audio Visual Alarm)

Gannon Dunkerley & Co. Ltd.
(Look under Audio Visual Alarm)

Jardine Henderson Ltd.
(Look under Belt Conveyor)

McNally Bharat Engg. Co. Ltd.
(Look under Belt Conveyor)

Sayaji Iron & Engg. Co. Pvt. Ltd.
(Look under Belt Conveyor)

Tata-Robins-Fraser Ltd.
(Look under Belt Conveyor)

Equipment & Spares Corpn.
(Look under Pump Accessories)

Hyderabad Industries Ltd.,
(Look under Mobile Crusher)

Kirloskar Brothers Ltd.
(Look under Pump Accessories)

Radiant Engg. Industries Pvt. Ltd.
(Look under Coal Handling Plant)

Sunbeam Engg. Works
(Look under Mineral Beneficiation)

SCREEN PROP

Acharya Brothers
(Look under Endless Haulage)

Emar (India) Pvt. Ltd.
(Look under Roof Bolts)

Khandelwal Industries
(Look under Idler Roller)

Manoj Industries
(Look under Idler Roller)

Burma Engg. Works
(Look under Friction Props)

Indrajit Enterprises
G.T. Rd. (W), Neamatpur, P.O. Sitarampur-713 359
(Burdwan), West Bengal.

Mand Valley Minerals Pvt. Ltd.
(Look under Roof Bolting Accessories)

Micon Engineers
(Look under Prop Setting Device)

Mining & Allied Machinery Corpn.
(Look under Auxillary Fan)

Nanda Manufacturing Co.
(Look under Anemometer)

R. N. Yadav & Co.
(Look under Coal Handling Plant)

United Engg. Co.
(Look under Roof Bolting Accessories)

M.P. Engg. Works
(Look under Face Pump)

Nanda Millar Co.,
(Look under Anemometer)

Soney Enterprises
(Look under Roof Bolts)

Vir Industries
(Look under Idler Roller)

SECONDARY CRUSHER

Bharat Westfalia Ltd.
(Look under Audio Visual Alarm)

Heavy Engg. Corpn. Ltd.
(Look under Bucket Wheel Excavator)

Radiant Engg. Industries Pvt. Ltd.
(Look under Coal Handling Plant)

Sunbeam Engg. Works
(Look under Mineral Beneficiation)

Greaves Cotton & Co. Ltd.
(Look under Audio Visual Alarm)

McNally Bharat Engg. Co. Ltd.
(Look under

Sayaji Iron & Engg. Co. Pvt.
(Look under Belt Conveyor)

Tata-Robins-Fraser Ltd.
(Look under Belt Conveyor)

SELF CONTAINED BREATHING APPARATUS

Fireteck Systems
(Look under Fine Alarm)

Mine Safety Appliances Ltd.
(Look under Audio Visual Alarm)

SELF RESCUER

Fireteck Systems
(Look under Fine Alarm)

Voltas Ltd.
(Look under Auxillary Fan)

Mine Safety Appliances Ltd.,
(Look under Audio Visual Alarm)

SHACKLES

Acharya Borthers
(Look under Endless Haulage)

Gannon Dunkerley & Co. Ltd.
(Look under Audio Visual Alarm)

Khandelwal Industries
(Look under Idler Roller)

Micon Engineers
(Look under Prof Setting Device)

Nanda Manufacturing Co.
(Look under Anemometer)

Burma Engg. Works
(Look under Friction Props)

The Indian Link Chain Manufacturers Ltd.
Lal Bahadur Shastri Marg, Bhandup,
Bombay-400 078.

Manoj Industries
(Look under Idler Roller)

M.P. Engg. Works
(Look under Face Pump)

Soney Enterprises
(Look under Roof Bolts)

SLURRY PUMP/PNEUMATIC PUMP

Akay Industries
(Pro.: The Arjan Khimji Ginning & Pressing Co. Pvt. Ltd.) Poonam Chambers, G. Block, Shiv Sagar Estate, Bombay-400 018.

Emico Elecon (India) Ltd.
(Look under Conveyor)

Hyderabad Industries Ltd.
(Look under Mobile Pressure)

Kirloskar Brothers Ltd.
(Look under Pump Accessories)

Mining & Allied Machinery Corpn. Ltd.
(Look under Auxillary Fan)

Water Supply Specialists Pvt. Ltd.
(Look under Pump Accessories)

Consolidated Pneumatic Tools Co. (I) Ltd.
(Look under Air Compresser)

Greaves Cotton & Co. Ltd.
(Look under Audio Visual Alarm)

Indian Drilling & Minning Co. Pvt. Ltd.
(Look under Diamond Core Drill)

Kishor Pumps Pvt. Ltd.
(Look under Pump Accessories)

Mody Industries (FC) Pvt. Ltd.
(Look under Pumps)

SPARES FOR HEAVY EARTH MOVING MACHINERY

Engineering Complex of India
(Look under Roof Bolts)

R. N. R. Udyog
Raj Colony, Sindry Road, Jharia, Dhanbad.

Steelgate Piston Rings Industries
14, Kutchery Rd., (Baluganj), P.B. No. 94,
Agra-282 001 (U.P.)

Equipment & Spares Corpn.
(Look under Pump Accessories)

Simplex Engg. & Foundry Works (P) Ltd.
(Look under Breaker)

SQUARE CHOCKS

Bharat Westfalia Ltd.
(Look under Air Cooling System)

Khandelwal Industries
(Look under Idler Roller)

Manoj Industries
(Look under Idler Roller)

M.P. Engg. Works
(Look under Face Pump)

The New Engg. & Electric Co.
G.T. Rd., Neamatpur, Sitarampur P.O. Dist. Burdwan.
West Bengal.

United Engg. Co.
(Look under Roof Bolting Accessories)
Burma Engg. Works
(Look under Friction Props)

Mand Valley Minerals Pvt. Ltd.
(Look under Roof Bolting Accessories)

Micon Engineers
(Look under Prop Setting Device)

Nanda Manufacturing Co.
(Look under Anemometer)

Soney Enterprises
(Look under Roof Bolts)

Vir Industries
(Look under Idler Roller)

STATIONARY CRUSHERS

Bharat Westfalia Ltd.
(Look under Air Cooling System)

Hyderabad Industries Ltd.,
(Look under Mobile Crusher)

Radiant Engg. Industries (P) Ltd.
(Look under Coal Handling Plant)

Sunbeam Engg. Works
(Look under Mineral Beneficiation)

Greaves Cotton & Co. Ltd.,
(Look under Audio Visual Alarm)

Larsen & Toubro Ltd.
(Look under Bucket Wheel Excavator)

Sayaji Iron & Engg. Co.
(Look under Belt Conveyor)

STATIONARY ROCK BREAKER

Bharat Westfalia Ltd.
(Look under Air Cooling System)

Radiant Engg. Industries Pvt. Ltd.
(Look under Coal Handling Plant)

TIL Ltd.
(Look under Cranes)

Karnataka Rockdrill Pvt. Ltd.
30/1, Cunningham Rd., Bangalore-560 052.

Sunbeam Engg. Works
(Look under Mineral Beneficiation)

STONE CRUSHERS

Bhartia Engg. Syndicate
Bhartia Rd., P.O. & Dist., Sahibganj, Pin: 816109
(Bihar).

SURVEY EQUIPMENT

Allies Instruments
Rampur Rd., Roorkee-247 667.

East End Engineers
52, Bhupendra Bose Avenue, Calcutta-700 004.

SUBMERSIBLE PUMP

Amrit Engg. Pvt. Ltd.
115/1&2, G.I.D.C. Estate, Kansa Rd.,
Visnagar-384 315, Dist.: Mehsana (N.G.)

Kishor Pumps Pvt. Ltd.
(Look under Pump Accessories)

MacNeill & Magor Ltd.
(Look under

Sigil (India) Services Pvt. Ltd.
(Look under Pump Accessories)

Water Supply Specialists Pvt. Ltd.
(Look under Pump Accessories)

Bhangar Brothers & Co. Ltd.
(Look under FLP Motor)

LMP Precision Engg. Co. Pvt. Ltd.
(Look under Diamond Core Dill)

Mody Industries (FC) Pvt. Ltd.
(Look under Pumps)

Upaj Engg. Pvt. Ltd.
(Look under Pumps)

TRACK ACCESSORIES

Acharya Brothers
(Look under Endless Haulage)

Friends Industrial Enterprises
8-9A, Industrial Estate, Paratap Nagar,
Udaipur-313 001.

Micon Engineers
(Look under Prop Setting Device)

Simplex Engg. & Foundry Works (P) Ltd.
(Look under Breaker)

Equipment & Spares Corpn.
(Look under Pump Accessories)

K.N.D. Industries
6/1A, Kumar Para Rd., Liluah, Howrah.

Rama Industries
43, Netaji Subhas Rd., P.O. Liluah, Dist.: Howrah.

TRAINGULAR CHOCKS

Bharat Westfalia Ltd.
(Look under Air Cooling System)

Khandelwal Industries
(Look under Idler Roller)

Manoj Industries
(Look under Idler Roller)

MP Engg. Works
(Look under Face Pump)

Soney Enterprises
(Look under Roof Bolts)

Burma Engg. Works
(Look under Friction Props)

Mand Valley Minerals Pvt. Ltd.
(Look under Roof Bolting Accessories)

Mining & Allied Machinery
(Look under Auxillary Fan)

Nanda Manufacturing Co.
(Look under Anemometer)

Vir Industries
(Look under Idler Roller)

TUGGER HAULAGE

Bharat Westfalia Ltd.,
(Look under Air Cooling System)

Eimco Elecon (I) Ltd.
(Look under Conveyor)

Jardine Henderson Ltd.
(Look under Belt Conveyor)

Mining & Allied Machinery Corpn.
(Look under Auxillary Fan)

Conveyor & Ropeway Services
(Look under Belt Conveyor)

Greaves Cotton & Co. Ltd.
(Look under Audio Visual Alarm)

MaNally Bharat Engg. Co. Ltd.
(Look under Belt Conveyor)

Vishwa Engg. Works
(Look under Auxillary Fan)

TYRE HANDLER

Bharat Earth Movers Ltd.
(Look under Bucket Wheel Excavator)

Mahindra Owen Ltd.
148, Bombay Pune Rd., Pimpri, Pune 411 018.

Greaves Cotton & Co. Ltd.,
(Look under Audio Visual Alarm)

Texmaco Ltd.
Regd.Off.: Belgharia, Calcutta-700 056.
Tel.: 581631/581722/582416/
581672/581713/581786/582388.

VALVES

Akay Industries
(Look under Slurry Pump)

Burn Standard Co. Ltd.
(Look under Coal Handling Plant)

Kejriwal Iron & Steel Works
12/1, Grish Gosh Rd., Liluah, Howrah.

Mohit Engg. Concern
144, Naransingha Dutta Rd., Kadamtala,
Howrah-711 101, West Bengal.

Bengal United Co. Pvt. Ltd.
36, Strand Rd., Calcutta-1

Gannon Dunkerley & Co. Ltd.
(Look under Audio Visual Alarm)

Metropolitan Trading Co.
30, Chitaranjan Avenue, Calcutta-700 012.

VENTILATION ACCESSORIES

Bharat Westfalia Ltd.
(Look under Air Cooling System)

Gannon Dunkerley & Co. Ltd.,
(Look under Audio Visual Alarm)

F. Harley & Co. Ltd.,
5, Rameswar Shaw Rd., Calcutta-700 014.

Nanda Millar Co.,
(Look under Anemometer)

VENTILATION DUCTING

Bharat Westfalia Ltd.
(Look under Air Cooling System)

F. Harley & Co. Pvt. Ltd.
(Look under Ventilation Accessories)

Gannon Dunkerley & Co. Ltd.
(Look under Audio Visual Alarm)

Burma Engg. Works
(Look under Friction Props)

Friends Industrial Enterprises
(Look under Track Accessories)

Greaves Cotton & Co. Ltd.
(Look under Audio Visual Alarm)

Indrajit Enterprises
(Look under Screen Props)

Manoj Industries
(Look under Idler Roller)

Khandelwal Industries
(Look under Idler Roller)

Vir Industries
(Look under Idler Roller)

WELDING COMPONENTS

Engineering Complex of India
(Look under Roof Bolts)

Intek
(Look under OHM Meter)

Indian Oxygen Ltd.
Regd. & Head Office:
OXYGEN HOUSE, P. 43, Taratala Rd.,
Calcutta-700 088.

WELDING EQUIPMENT

Indian Oxygen Ltd.,
(Look under Welding Components)

Kirloskar Electric Co. Ltd.,
Regd. & Head Office:
P.B. No. 5555, Malleswaram West,
Bangalore-560 055. Tel.: 357771/359111.

WINCHES/HOIST

Bharat Westfalia Ltd.
(Look under Air Cooling System)

Eimco Elecon (India) Ltd.
(Look under Conveyor)

Greaves Cotton & Co. Ltd.
(Look under Audio Visual Alarm)

Jardine Henderson Ltd.
(Look under Belt Conveyor)

Simplex Engg. & Foundary Works (P) Ltd.
(Look under Breaker)

Voltas Ltd.,
(Look under Auxillary Fan)

Conveyor & Ropeway Services
(Look under Belt Conveyor)

Gannon Dunkerley & Co. Ltd.,
(Look under Audio Visual Alarm)

IEC Dusterlock Pvt. Ltd.,
603, Sadashiv Peth, Laxmi Rd.,Pune-411 030 (India).

McNally Bharat Engg. Co. Ltd.
(Look under Belt Conveyor)

Vishwa Engg. Works
(Look under Auxillary Fan)

WINDER

Bharat Westifalia Ltd.
(Look under Air Cooling System)

Mining & Allied Machinery Corpn. Ltd.
(Look under Auxillary Fan)

Vishwa Engg. Works
(Look under Auxillary Fan)

Jardine Henderson Ltd.,
(Look under Belt Conveyor)

Radiant Engg. Industries Pvt. Ltd.,
(Look under Coal Handling Plant)

WIRE MESH

Evergreen Wirecloth Factory Pvt. Ltd.
3-D, Maker Bhavan No. 2, 18, New Marine Lines, P.B. No. 11100, Bombay-400 020.

Manohar Engg. Co.
3-D, Maker Bhavan No. 2, 18, New Marine Lines, Bombay-400 020.

Swiss Welded Mesh Co. Pvt. Ltd.,
A-7, Industrial Estate, Madras-600 058.

WIRE ROPE FITTINGS

Micon Engineers
(Look under Prop Setting Device)

Nanda Millar Co.
(Look under Anemometer)

Nanda Manufacturing Co.,
(Look under Anemometer)

ANNEXURE 33

SOME IMPORTANT CANADIAN GOVERNMENT ADDRESSES

1. Asia Pacific South Trade Division
   Department of External Affairs and International Trade Lester B.
   Pearson Building, 125 Sussex Drive, Ottawa, Ontario KIA OG2, Canada
   Telephone: (613) 996-5903 Telex: 053-3745 Fax: (613) 996-4309

2. Canadian High Commission
   P.O. Box 5208, Shantipath, Chanakyapuri, New Delhi 110 021, India.
   Telephone: 6876500 Telex: 031-72363 Fax: 687-6579

3. Consulate of Canada
   Suite 2401, Hotel Oberoi Towers, Nariman Point,
   Bombay 400 021, India.
   Telephone: 2024343 Extn: 2401/2402 Telex: 84153/84154 OBBY IN Fax: 287-5514

4. The Department of Industry, Science and Technology, 235, Queen Street, Ottawa, Ontario KIA OH5, Canada
   Telephone: (613) 954-3344 Telex: 053-4123 Fax: (613) 952-8419
   (Industry, Science and Technology Canada maintains International Trade Centres in all provinces of Canada)

5. Canadian International Development Agency (CIDA) 200 Promenade du Portage, Hull, Quebec KIA OH4, Canada
   Telephone: (819) 997-0563 Telex: 053-4140 Fax: (819) 953-5024

6. Manager, South Asia
   Export Development Corporation (EDC)
   151 O'Connor Street, Ottawa, Ontario KIA OH5, Canada
   Telephone: (613) 598-2500 Fax: (613) 598-2503

7. Canada-India Business Council (CIBC)
   1160-55 Meltcalfe Street, Ottawa, Ontario KIP 6N4, Canada
   Telephone: (613) 238-4000 Telex: 053-3360 CANCHAM OTT Fax: (613) 238-7643

8. Canadian Manufacturers Association (CMA)
   One Yonge Street, Toronto, Ontario M5E, 1J9, Canada
   Telephone: (416) 363-7261 Telex: 065-24693 Fax: (416) 363-3779
   Contact: Ms Doreen Wallace Ruso, Director, Trade Development